15¢
$5.00 A YEAR

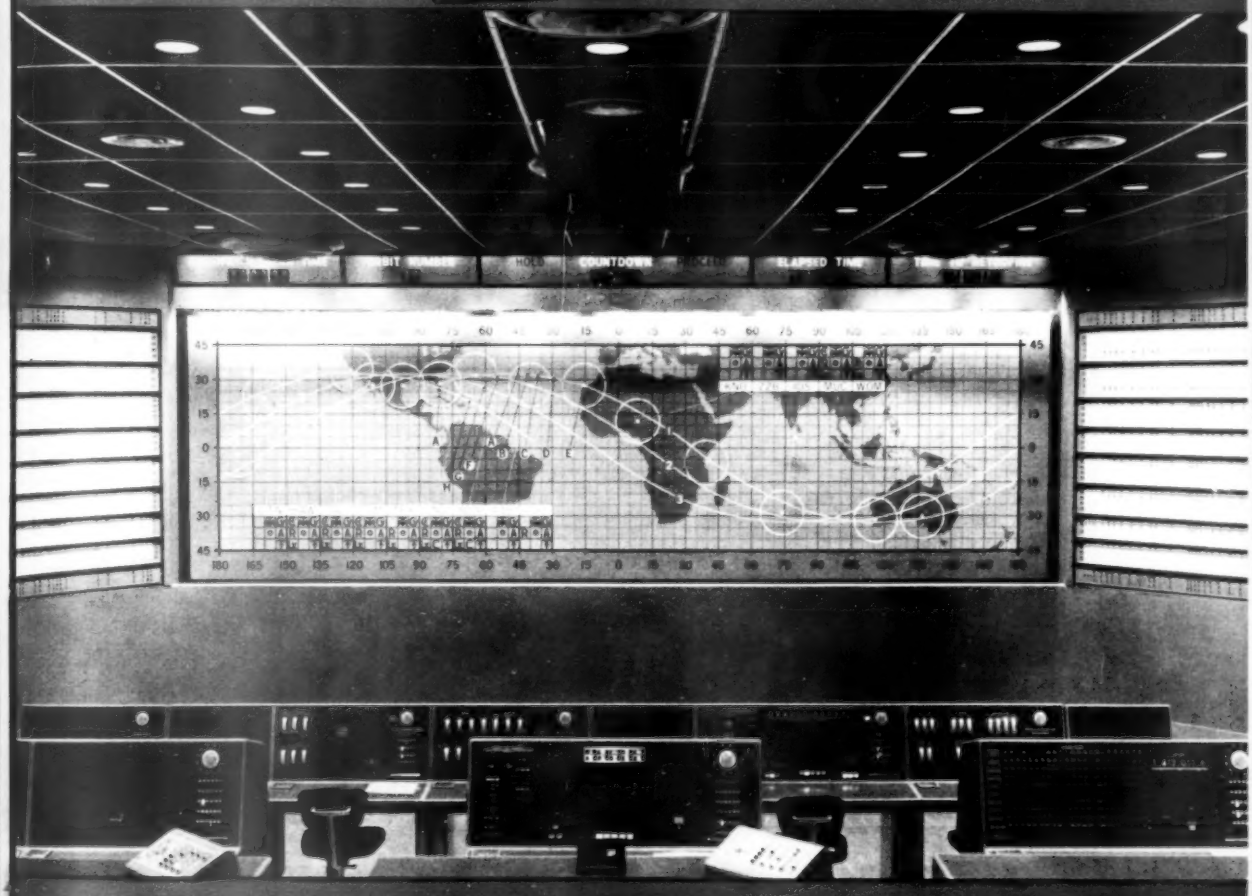
April 29, 1961

VOL. 79, NO. 17 PAGES 257-272

SCIENCE NEWS LETTER

RECEIVED
MAY 1 - 1961
MIAMI UNIVERSITY

THE WEEKLY SUMMARY OF CURRENT SCIENCE



Space Capsule Path

See Page 261

MIAMI UNIV LIBRARY
PERIODICAL RECORD
OXFORD OHIO
DEC 61 944-127 2A 4

A SCIENCE SERVICE PUBLICATION

PUBLIC HEALTH

Radiation Exposure

➤ A DOSIMETER to keep a constant, cumulative record of any ionizing radiation to which the body is exposed over long periods has been developed by U. S. Navy scientists.

It can detect and record from one up to 300,000 roentgens, from the ionization radiation given off by a luminous watch dial to that from an atomic reactor. It is intended especially for Navy personnel working in the vicinity of atomic installations.

Dr. J. H. Schulman and his associates of the Naval Research Laboratory, Washington, described the dosimeter at a conference sponsored by the Office of Naval Research at the U.S. Naval Academy, Annapolis, Md.

At present radiation exposure is detected by a photographic film badge that must be developed in a photographic laboratory, is good for only one continuous exposure, and is more affected by low-energy than high-energy radiation. After being used once, it is thrown away.

The new dosimeter is in the form of a minute vacuum tube containing a white powder, a form of calcium fluoride, developed especially for the purpose by the Navy laboratory. Electrons emitted by atomic radiation are trapped in the crystals of this powder.

When heated, the particles emit light in the blue-green region of the spectrum. The brightness of this light is directly proportional to the amount of energy stored in the crystals. The storage time extends for at least two weeks without any appreciable leakage. It is necessary only to renew the powder to use the device over and over again.

The tube can be made sufficiently small to be implanted in a particular location to determine the radiation absorption of any part of the body, such as bones or a particular bone, a lung, etc. It can detect as little as one-hundredth of a roentgen when used in this way.

The dosimeter is expected to have a wide applicability in medical research, and in treatment of radiation injuries.

• Science News Letter, 79:258 April 29, 1961

Mixtures Analyzed

➤ NAVY CHEMISTS now can detect as little as one-quadrillionth of an ounce of a chemical element in a mixture.

They can analyze the contents of less than 40-millionths of a cubic inch.

This was reported by Drs. R. E. Seebold and L. S. Birks of the Naval Research Laboratory, Washington, at a conference sponsored by the Office of Naval Research at the U. S. Naval Academy in Annapolis, Md. The technique, they said, promises to be of considerable importance in studies of metallic alloys and air-carried dust.

The extremely fine analysis is made possible by the "electron probe micro-analyzer," largely developed by the Research Laboratory technicians.

The probe must operate in a high vacuum. At the top is an "electron gun," able to shoot forward a stream of electrons at energies between 10,000 and 500,000 volts. This stream is focussed by two magnetic lenses on a spot about a four-hundred-thousandth of a square inch, or even considerably less, in area. The impact of the electrons causes the various elements in the ultra-microscopic sample to generate their characteristic X-rays, the spectrum of which has been established in other experiments.

The apparatus is equipped with an X-ray analyzing system, which splits them into their various wavelengths. The intensity of the X-ray bundles of the various characteristic wavelengths is a measure of the amount of an element in the mixture, such as iron, chromium, magnesium and other ingredients in stainless steel.

• Science News Letter, 79:258 April 29, 1961

MEDICINE

Hormone Given Too Often

➤ THYROID HORMONE is prescribed too often for persons it does not benefit, a Mayo Clinic gland specialist warned family doctors.

Dr. Edward H. Rynearson of Rochester, Minn., said physicians often give thyroid to obese or tired patients to see what it will do but make little effort to evaluate its results.

Hormones from the thyroid gland are the most commonly prescribed of all hormones, Dr. Rynearson told the American Academy of General Practice meeting in Miami Beach, Fla.

• Science News Letter, 79:258 April 29, 1961

Emergencies in Labor

Emergencies in the first stages of labor were blamed for preventable maternal deaths by Dr. Denis Cavanagh of the University of Miami School of Medicine.

"Preventable maternal deaths are the greatest tragedy in the practice of medicine," Dr. Cavanagh said, pointing out that it is sometimes possible to spot early indications of a developing emergency. Convulsions or a coma are often preceded by severe headaches, visual problems, pains over the stomach and vomiting.

Tying off the two large arteries that supply blood to the pelvic region can prevent many deaths from hemorrhaging in childbirth and gynecological operations, two Chicago physicians believe. They illustrated their method of ligating the internal iliac arteries at the American Academy of General Practice meeting in Miami Beach.

Drs. Walter J. Reich and Mitchell J. Nechtow of Cook County Hospital, Chicago, said this is a method that can save the uterus of a young mother hemorrhaging in childbirth.

• Science News Letter, 79:258 April 29, 1961

MEDICINE

Brain Damage Detected By Psychological Tests

➤ UNDETECTED BRAIN DAMAGE, which may cause behavior, language and learning problems in children of normal intelligence, may show up in psychological tests.

Dr. Raymond L. Clemmens, director of the Central Evaluation Clinic for Handicapped Children, University of Maryland School of Medicine, Baltimore, told the American Academy of Pediatrics meeting in Washington that the usual neurological examination, even when expertly performed, may not reveal causes of disorder.

Minimal brain damage, causing the brain to function less than normally, can cause deviations in behavior and learning, as well as minor hearing and seeing problems, Dr. Clemmens said.

These peculiarities may not be noticed until the late pre-school or early school years, the pediatrician reported.

"Psychological testing may yield positive evidence of organic cerebral dysfunction although the classical neurological examination is negative," he said.

Dr. Felix P. Heald, director, adolescent medicine, Children's Hospital, Washington, told the meeting that a study of body fat in adolescent patients should become a routine part of examinations.

"Changes in total body fat during adolescence are not well understood," Dr. Heald said. The fact that there are normal and important differences in body fat between adolescent boys and girls has received little emphasis.

• Science News Letter, 79:258 April 29, 1961

DERMATOLOGY

Ringworm Epidemic Caused by Soil Infection

➤ AN EPIDEMIC of ringworm infection in a cucumber greenhouse in Alcester, England, has been traced to infected soil.

This is the first time, the researchers report, that an epidemic has been reported caused by *Microsporum gypseum* in which the fungus was grown from soil. This confirmed that infection was actually contracted from the soil itself.

Twenty-two persons, including children infected by parents working in the greenhouse, got ringworm as a result of the infected soil.

Dr. J. Alsop, a general practitioner in Alcester, and Dr. A. P. Prior of the South Warwickshire Hospital Group, report the findings in the British Medical Journal, April 15, 1961.

• Science News Letter, 79:258 April 29, 1961

CHEMISTRY

Element 103 Synthesized

Element 103 has been synthesized as the last of its series. The next new element to be made by man will have properties unlike the other synthetic elements.

➤ THE NEXT NEW CHEMICAL element to be made by man, No. 104, will have properties entirely unlike the other synthetic elements, Nos. 93 through 103. The finding of element No. 103 closes the books on the actinide series since it is the last one of this group of the building blocks of the universe.

Element No. 104 should resemble hafnium and zirconium in its physical and chemical properties since it falls directly under them in the periodic table.

The various compounds of the next new element should be relatively easy to separate from the compounds of the actinides by solvent extraction, since there are marked differences in solubility.

The series of elements to be opened up by the discovery of element No. 104 are the fourth of the so-called "transitional metal series." These will include elements No. 104 through 112, if and when they are produced. The elements No. 112 through 118 will complete the seventh row in the periodic table, and also will have different properties.

The larger the atomic number, the shorter the life of the element. The half-life of element No. 103 is found to be about eight seconds. The chance of the production and identification of elements beyond No. 103 grows progressively dim. Element No. 110 has a predicted half-life of one-hundredth of a second, which may be the limit of discovery.

Element No. 103 was produced by bombarding three-millionths of a gram of californium with boron-10 or boron-11 nuclei having energies of about 70,000,000 electron volts. This was accomplished using the heavy ion linear accelerator (HILAC) in the Lawrence Radiation Laboratory of the University of California in Berkeley.

Californium was bombarded with boron nuclei and then the californium atoms emitted neutrons, thus changing the californium into element 103. The very few atoms of 103 so formed were caught on a thin copper conveyor belt that carried them in front of a series of silicon crystal detectors. Here alpha particles with 8.6 million electron volts of energy were detected. Final proof of the existence of element 103 consisted in carrying out experiments to rule out the possibility of the alpha particles coming from atoms of nobelium or mendelevium.

The atomic weight of this new element is thought to be no more than 257 but further work is planned to determine this accurately.

Since 1940, University of California scientists have discovered or participated in the discovery of ten synthetic elements heavier than uranium—from neptunium, element No. 93, through element No. 102. Who gets the credit for the discovery of element No. 102 is still a matter of controversy. A research group in Stockholm, Sweden, reported its preparation in 1957 but their results were disputed by the California scientists.

A report on the research leading to the discovery of element No. 103 has been submitted to Physical Review Letters by Drs. Albert Ghiorso, Torbjorn Sikkeland, Almon E. Larsh and Robert M. Latimer. Their work was supported by the U. S. Atomic Energy Commission.

The discoverers have suggested that the element be named lawrencium in honor of the late Dr. Ernest O. Lawrence, Nobel Prize winner, founder of the laboratory in which the discovery was made.

• Science News Letter, 79:259 April 29, 1961

TECHNOLOGY

Can Score Space First

➤ COMMUNICATION satellites offer the United States its best chance to beat the Russians to a spectacular first in space.

The United States now leads in this area of space research. The development of an operational satellite communications system by the United States for world use would reduce substantially the international impact of the Soviet achievement in manned space flight, many scientists and Government officials in Washington believe.

Rep. Jessica McC. Weis (R.-N.Y.), a member of the House Committee on Science and Astronautics, has asked the National Aeronautics and Space Administration to "leapfrog" and push ahead in communications development in space.

A report by the House space committee said " . . . the first world-wide communications system of this (satellite) type, and whether it is conducted in English or Russian, may have crucial prestige and propaganda ramifications."

Industry is eager to participate and share the cost in such a program. The American Telephone and Telegraph Company has offered to pay the Government the cost of experimental satellites and their launchings. However, NASA has announced it will continue development of its communication satellite program without industry investment.

"It is too early to start to negotiate with private industry in this field and unfair to industry to have it assume risks unknown at this time," James E. Webb, NASA administrator, said.

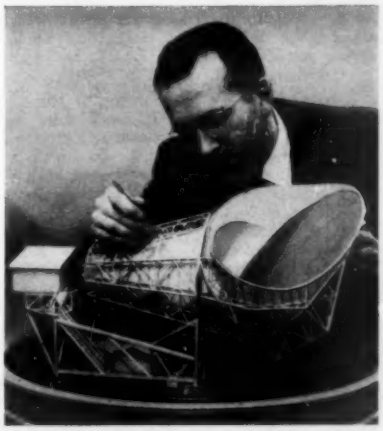
NASA officials have budgeted for a communications program, but the amount allotted is not sufficient for a crash effort. However, the entire program of communication satellites is under review.

A study by A. T. & T. on industry participation concluded that "the cost of the latest, most efficient overseas cable now being designed . . . will be substantially more per circuit than the indicated cost for satellite communication."

In addition to A. T. & T., other companies are vitally interested in development of an operational communications system by means of satellites, among these Radio Corporation of America, Philco, General Electric, International Telephone and Telegraph, General Telephone and Electronics, Collins Radio, Lockheed Aircraft and Hughes Corp.

Their interest is reinforced by scientific estimates that satellites can multiply present long-distance communications by as much as 10,000 times and can contribute to long-range radio communications and even to international TV.

Population increases, the personal and industrial demands on present facilities for communication, complicated by the saturation of the conventional radio spectrum, emphasize the need for a satellite communications system. A hornshaped antenna to be built this year near Rumford, Me., will be used for experiments in sending television and highspeed data as well as telephone calls across the Atlantic by way of satellites.



HORNSHAPED ANTENNA — For TV and telephone by satellite.

The antenna will be 177 feet long and housed in an inflated radome made of synthetic rubber and fabric that is "transparent" to radio waves. The radome will be 210 feet across and 161 feet high. People and even trucks will enter the dome through air locks to keep it from deflating.

The antenna, to be built by American Telephone and Telegraph Company, rotates on two circular tracks and also turns about its horizontal axis.

• Science News Letter, 79:259 April 29, 1961

SCIENTIA INTERNATIONAL

NOVAS DEL MENSE IN INTERLINGUA

Alcohol.—Le effecto de alcohol super le functionamento del systema nervose es inadequatemente cognoscite, insiste Dr. A. Carpenter del Universitate Yale. Dr. Carpenter, in collaboration con un gruppo de collegas, ha trovate a base de multe experimentos que un grande numero de notiones currente in iste area es de facto erronee. Un bon exemplo es le "effecto relaxatori" de alcohol, un phenomeno que trova nulle supporto del toto in ulle del experimentos essayate per le gruppo de investigatores a Yale. Un remarcabile constatation positive, del altere latere, esseva que le capacitate de subjectos human de solver complexe problemas intellectual (de mathematica, per exemplo) non suffre sub le effecto de alcohol si le consumo de illo es minus que 1 ml per kg de peso corporee intra un intervallo de 15 minutes. Le functionamento del systema motori e del systema sensori, per contrasto, es afficite multo plus brutalmente per multo plus micre quantitates de alcohol ingerite. Secundo Dr. Carpenter, intense investigationes experimental in iste area es un urgente desiderato. Que, per exemplo, es le effecto do alcohol super nostre capacitate de solver simple problemas mental? O problemas ancora plus complexe que illos mentionate in supra? Secundo Dr. Carpenter nulle responsas de fidelitate scientific es cognoscite a tal questiones al tempore presente.

Archeologia.—Le prova que le homine viveva plus que 25 milles annos retro in gruppationes social del typo de nostre villages esseva establiste per medio del technica de datation a carbon-14. Le specimens veniva de Iraq. Le studios esseva executate per Dr. R. S. Solecki del Universitate Columbia in New York.

Astronautica.—In le estimation de functionarios de NASA (i.e. le statounitese Administration National pro le Aeronautica e Recercas Cosmic), le recente successo del russos in inviar un homine circum le terra in un satellite artificial illumina frappantemente le stato comparative del technologia rocchettari in Russia e le Statos Unite. Si il es justificate previder—assi argue ille functionarios—que le Statos Unite pote plantar humanos in le luna in 1971, il es etiam justificate previder que le russos va comenciar lor colonisation del luna in 1965 o 1966. Isto significa que le prime lunonautas american, in arrivar in le luna, va esser salutate per un committee de reception sovietic.

Fructicultura.—Es ben cognoscite que pomieros seque un rhythmo bienne in lor productivitate: Un anno de ricchessa relative de pomos e de pauperitate relative de folios es sequite per un anno de pauperitate relative de pomos e de ricchessa relative de folios. Secundo un recentemente accordate patente, applicationes de varie derivatos de acido trichlorobenzoic al florescentia del annos "ric in pomos" assecura un repetition del mesme performance le anno sequente. Simile methodos essayate in le passato non se ha provate efficace.

Hygiene.—Sal de cocina, in quantitates de un coclearata o minus, pote producer serie lesiones cerebral in infantes.

Psychologia Animal.—Secundo recercas effectuate al Laboratorios Jackson de Bar Harbor, Maine, juvene canes que non es toccate e caressate per manos human durante le prime tres o quatro menses de lor vita va nunquam esser preste a entrar in relationes amical con humanos.

Recercas de Biologia Radiatori.—Serotonina, un neurohormon (que es etiam disponibile in forma purificate como droga biologic) reduce le effecto mortal de irradiationes del corpore total. Le dose de irradiation que occide 50 pro cento de un gruppo de muses experimental intra un periodo de 30 dies es normalmente 542 r. Post le tractamento con serotonina, le mesme effecto non es obtenibile per minus que 880 r. Le these que le mechanismo de iste effecto protectori de serotonina es relationate al facto que serotonina reduce le provision de oxygeno in certe tissus vital del organismo esseva testate per exponer muses (durante e post le application experimental de radios X) a un atmosphera saturate de oxygeno. Le mortalitate cresceva marcatemente, in consequentia del facto—il pare—que le provision intratissular de oxygeno esseva re-augmentate contra e in despecto del tendentias inhibitori de serotonina. Iste constatationes es reportate per Dr. J. Doull e Dr. B. J. Ticou del Universitate Chicago. (Le facto que serotonina protege contra le effectos letal del irradiation es de interesse theoric. In le practica un protector multo plus potente es requirite e—super toto—un protector retroactive.)

Recercas de Leucemia.—Cinquanta pro cento del mortalitate per leucemia es occasionate per hemorrhagias que es le consequenttia directe de un carentia (1) de plachettas sanguinee e (2) del cellulas special—cognoscite como megacaryocytos—que es le productores del plachettas. Un gruppo de recercatores in Toledo, Ohio, sub le direction de Dr. B. Steinberg, ha demonstrate que le generation de megacaryocytos depende del presentia de un certe composito biochimic que non es adequatemente representate in leucemia e que le production de plachettas per le megacaryocytos etiam depende de un certe composito biochimic que etiam es representate inadequatemente in leucemia. Le scientistas a Toledo ha succedite a extraher le duo compositos ab sanguines normal. Illes appella le prime "megacaryopoiesina" e ha trovate que injectiones de illo in patientes con leucemia augmenta de facto le production de megacaryocytos (ben que non le production de plachettas). Le scientistas appella le secunde composito "thrombopoiesina" e ha trovate que injectiones de illo in patientes con leucemia (qui ha previemente recipite injectiones de megacaryopoiesina) augmenta le production de plachettas per le megacaryocytos. Il es possibile que iste discopertas va resultar in le curso del tempore in un nove therapia pro leucemia. Al momento presente, le scientistas insiste, le methodo non es un therapia sed un technica de recerca.

Scientias del Terra.—Foratione submarin al west de Mexico in le vicinitate de Guadelupe es in progresso, representante le prime phases preliminari del projecto "Mohole" que visa a perciar—ultimemente—le crusta del terra e a penetrar in le mantello. Le nave de recerca, Cuss I, que servi como plateforma pro le forationes a iste tempore, se trova ancorate in aqua de un profundor de plus que 4.000 metros. Le observationes jam facite include le constatation que le temperatura a 150 metros infra le fundo del oceano es inexpectatemente alte. Specimens ab un foramine de 40 metros de profundor indica que 25 milliones annos retro le vita marin al fundo del oceano in le region de Guadelupe esseva extrememente ric. Hodie illo es extrememente magre.

Transporto.—Un vehiculo aero-terrestre va tosto esser producite in serie per un firma statounitese a sede in Dallas, Texas. Usate como automobile, le vehiculo attinge un velocitate de 60 millias per hora. Como areoplano illo face 100 millias per hora. Durante viages terrestre le alas occupa un carro-remolco.

• Science News Letter, 79:260 April 29, 1961

GENERAL SCIENCE

Reading Interlingua

YOU CAN READ Interlingue if you had no more than one semester of high school French or Spanish or Latin and flunked it. You can read and understand a great deal of it even if you have never had contact with any foreign language.

Twenty-three medical journals regularly publish in Interlingua abstracts of their original papers.

Send this page to an acquaintance abroad and tell him that he can get additional information about Interlingua from Alexander Gode, SCIENCE SERVICE'S Interlingua Division, 80 E. 11th St., New York 3, N. Y.

Financial contributions to the Interlingua program are needed.

• Science News Letter, 79:260 April 29, 1961

SCIENCE NEWS LETTER
VOL. 79 April 29, 1961 No. 17

Edited by WATSON DAVIS

The Weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 1719 N St., N.W., Washington 6, D. C., NOrth 7-2255. Cable Address: SCIENSERVC.

Subscription rates: 1 yr., $5.50; 2 yrs., $10.00; 3 yrs., $14.50; ten or more copies in one package to one address, 7½ cents per copy per week; single copy, 15 cents, more than six months old, 25 cents. No charge for foreign postage.

Change of address: Three weeks notice is required. When ordering a change please state exactly how magazine is addressed. Your new address should include postal zone number if you have one.

Copyright © 1961 by Science Service, Inc. Republication of any portion of SCIENCE NEWS LETTER is strictly prohibited. Newspapers, magazines and other publications are invited to avail themselves of the numerous syndicated services issued by Science Service. Science Service also publishes CHEMISTRY (eight times a year) and THINGS of science (monthly).

Printed in U.S.A. Second class postage paid at Washington, D. C. Established in mimeograph form March 13, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Reader's Guide to Periodical Literature, Abridged Guide, and the Engineering Index. Member Audit Bureau of Circulations.

SCIENCE SERVICE

The Institution for the Popularization of Science organized 1921 as a non-profit corporation.

Board of Trustees—Nominated by the American Association for the Advancement of Science: William W. Rubey, University of California at Los Angeles; Wallace R. Brode; Douglas Whitaker, Rockefeller Institute for Medical Research. Nominated by the National Academy of Sciences: Harlow Shapley, Harvard College Observatory; Philip Bard, Johns Hopkins University; Henry Allen Moe, John Simon Guggenheim Memorial Foundation. Nominated by the National Research Council: Leonard Carmichael, Smithsonian Institution; John R. Dunning, Columbia University; Benjamin H. Willier, Johns Hopkins University. Nominated by the Journalistic Profession: Michael J. Ogden, Providence Journal-Bulletin; O. W. Riegel, Washington and Lee University; Ralph B. Curry, Flint Journal. Nominated by the Scripps Estate: Edward J. Meeman, Memphis Press-Scimitar; Frank Ford, Washington, D. C.; Charles E. Scripps, Cincinnati, Ohio.

Officers—President, Leonard Carmichael; Vice President and Chairman of Executive Committee, Charles E. Scripps; Treasurer: Wallace R. Brode; Secretary: Watson Davis.

Staff—Director: Watson Davis. Writers: Gloria Bell, Ann Ewing, Lillian Levy, Faye Marley, Vincent Marteka, Jane Marye, Tove Neville, Marjorie Van de Water, Judy Viorst, Burrell Wood. Science Youth Division: Joseph H. Kraus, Shirley Moore, Dorothy Schriver, Leslie Watkins. Photography: Fremont Davis. Production: Priscilla Howe, Marcia Nelson. Syndicate Sales: Hallie Jenkins. Librarian: Margit Friedrich. Interlingua Division in New York: Alexander Gode, 80 E. 11th St., GRamercy 3-5410. Advertising Manager: Fred A. Moulton, MEtropolitan 8-2562.

ROCKETS AND MISSILES

Flare Observed in Space

▶ THE SATELLITE Explorer X has observed a flare on the sun and measured a resulting magnetic storm on earth, the National Aeronautics and Space Administration in Washington, D. C., told SCIENCE SERVICE.

Explorer X, earlier called P-14, was launched March 25 and radioed information back to earth for 59 hours instead of the planned 55, NASA reported.

The magnetic tape recording this information at stations all over the world would cover 402 miles.

On the basis of one tape processed so far, NASA has learned that interstellar space contains magnetic fields of greater strength than expected. The information on the tape also indicates that the flow of charged particles in space is at relatively high velocities.

Information from the satellite bears out the theory that the interplanetary magnetic field in space surrounding the earth is a continuation of the field of the sun.

Dr. James P. Heppner of the National Aeronautics and Space Administration said that the earth's and the sun's fields meet out in space between 13 and 25 earth radii (52,000 to 100,000 miles). He said that at 58,000 miles the field had been measured by the satellite to be as strong as 20 to 35 gammas (a unit of magnetic field intensity). This, he said, could be expected from a solar wind.

At one point when the field was measured, great disturbances and fluctuations were taking place. During this time the field was found to change direction in less than two seconds. He said that five hours after the disturbance in the field the solar flare was observed.

This demonstrates for the first time that hydromagnetic shock waves can be propagated in the rarefied interplanetary media.

The large, short-lived fluctuations and shock waves are believed caused by blobs of matter sent out by the sun and traveling outward along the sun's magnetic field.

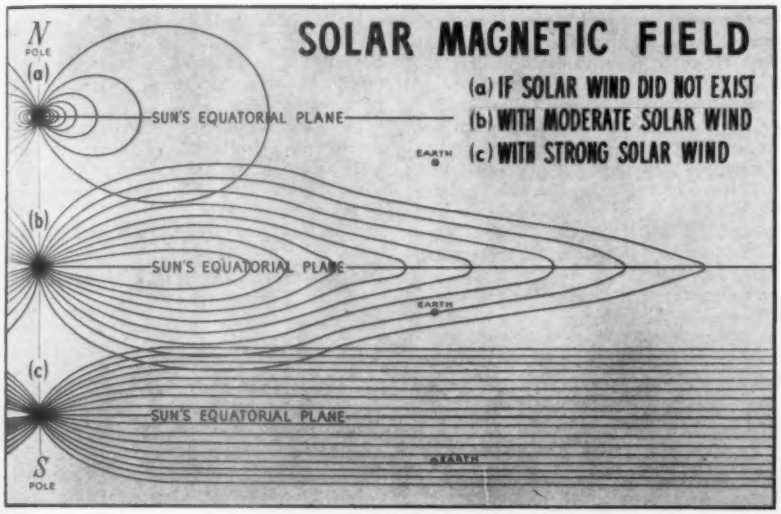
The solar flare observed by the satellite was of class III, described by Kent D. Boggs, chief forecaster at the North Atlantic Radio Warning Service, Fort Belvoir, Va., as being of fairly large size and bright. Solar flares often cause disturbances of radio and cable communications on earth.

Mr. Boggs told SCIENCE SERVICE that the Warning Service observed a flare on March 27 lasting about 18 hours. He said this flare caused moderate disturbance. It affected radio communications for about six hours near the end of the period.

He said the Warning Service would like to find aids in radio propagation forecasting so it can warn the nation when communication will be poor. Flares differ greatly as to the amount of radio disturbance they create.

One possible way of foretelling if a flare will have disturbing effects on radio has been worked out on a statistical basis, Mr. Boggs said. If an outburst of solar radio noise is heard during the first few minutes of the flare, it is likely to cause disturbances in radio, television and transatlantic telephone.

• Science News Letter, 79:261 April 29, 1961



SOLAR WIND REACHES INTO SPACE

BIOLOGY

All Life From One Spore

▶ ALL LIFE on earth may be descended from a single spore that hit this planet's lifeless surface after traveling for ages in the cold vast spaces between stars.

Dr. Edward Anders of the University of Chicago gives credence to this possibility from an analysis of what kind of organisms may be found on the moon. He concludes that organisms of earthly origin may very well be found on the moon, but the chances of finding lifelike forms from sources beyond the sun's system are overwhelmingly remote.

The idea that earth life was originated by organisms from interstellar space was first put forth early this century by Helmholtz, Arrhenius and others.

The latest addition to the moon by natural methods, Dr. Anders suggests, may have taken place when tiny specks of debris were smashed out of the earth by the Russian Tunguska meteorite. If Mars has microorganisms, the moon's surface should also hold samples of them, although they would be less numerous than earth's.

These findings, Dr. Anders reports in Science, 133:1115, 1961, suggest that the goals of a lunar biology program should be reconsidered. One of the principal aims would be a test of the theory that all life on earth came from a single spore ending its interstellar travels here. This would be shown by the presence or absence of earth's microorganisms on the moon.

If finding earth life on the moon could be predicted with certainty on the basis of present knowledge, sterilization of lunar probes would no longer be necessary, Dr. Anders said. Russians reportedly sterilized the rocket they crashed into the moon and the United States now plans to sterilize its lunar probes.

• Science News Letter, 79:261 April 29, 1961

ROCKETS AND MISSILES

Space Capsule Path Seen at Control Center

See Front Cover

▶ WHEN THE FIRST U. S. astronaut goes into orbit the path of his space capsule will be followed on a display map at the Project Mercury's Control Center at Cape Canaveral, Fla.

Information from the capsule's three orbits will flow into the center from stations located in the U. S., at Bermuda, on a ship in the mid-Atlantic Ocean, in Grand Canary Island, Nigeria, Zanzibar, on a ship in the Indian Ocean, in West and South Australia, Canton Island, Hawaii and Mexico.

All the stations are shown on the map in different colors with rings to indicate the communication and tracking range of each station.

To the left and right of the map, constructed by General Dynamics/Electronics, San Diego, Calif., are trend charts. The map is seen on the cover of this week's SCIENCE NEWS LETTER.

• Science News Letter, 79:261 April 29, 1961

PHYSICS

Understanding the Cosmos

➤ AN IMPORTANT advance in man's understanding of the universe, based on Einstein's theory of general relativity, was reported by Dr. John A. Wheeler of Princeton University, Princeton, N.J.

He has discovered that a picture of electrical charge can be built in curved empty space without assuming the existence of such a charge, as is done in other theories. "No mystic, magic jelly" is needed to explain electricity, Dr. Wheeler told the American Philosophical Society meeting in Philadelphia.

He said that "if electricity had not been discovered, but if a person knew of electromagnetic waves in empty space, as described by Maxwell's equations, and of curved empty space, as described by Einstein's general relativity theory, then the existence of the previously mysterious electricity could be predicted, provided that the space under consideration is multiple connected."

Dr. Wheeler said the existence of electricity in nature, the simple explanation for its existence in terms of a multiple connected space and the lack of any other explanation for electricity are good evidence that the physical world actually is multiple connected.

Dr. Wheeler explains the idea of multiple connected as follows:

A doughnut is a simple example of a multiple connected surface. Stretch a rubber string from one point on the surface of the doughnut around the small dimension and back to the same point. Or stretch it around the big circumference and bring it back to the point. There is no way to deform the rubber string so as to transform one route into the other. The surface is said to be "doubly connected."

In contrast, a flat or "Euclidean" surface that extends to infinity is said to be singly connected—rubber strings can be freely deformed to transform one route into any other route. The idea has long been considered that space is not Euclidean at great distances, as evidenced in the idea of a closed universe. But consideration has been given to the idea that space has a multiple connected or "wormhole" character at small distances.

Dr. Wheeler's suggestions are also the strongest support to date for the idea that the universe is as Einstein pictured it, with one theory covering the spinning of atoms and the gravitation of star-filled space.

The vision that the physical universe is composed of curved empty space, and nothing more, animated Einstein's work, although he did not live to see his dream fulfilled. However, since his death in 1955, Dr. Wheeler and Dr. Charles Misner, also of Princeton University, have discovered a way to describe both electromagnetism and gravity by mathematical equations.

They call their theory the "Already Unified Field Theory," using "already" because Einstein himself had accomplished this long ago but did not realize it.

Dr. Misner found that an electromagnetic field leaves "footprints in space" sufficiently detailed so someone measuring the curvature of space can learn everything necessary about that electromagnetic field.

Using only electromagnetic and gravitational fields, Dr. Wheeler has constructed objects that he calls "geons," which show all properties of mass but contain no real mass. Large geons can be considered as lots of light in a ball held together by its own gravitational attraction, much as the earth (a ball of matter) is held together by gravity.

• Science News Letter, 79:262 April 29, 1961

ASTRONOMY

Moon Has Electric Layer

➤ A THIN, electrically charged layer at the moon's surface is helping to smooth out the moon's valleys and ridges.

A sheath of electrons created by bombarding ultraviolet rays of the sun helps transport moon "dust" along the surface of the moon. The dust stops traveling when it falls into a crater or nestles in the shadow of a ridge.

Microscopic meteorites constantly pelting the moon raise a flurry of dust, Dr. S. F. Singer and E. H. Walker of the University of Maryland reported. The dust particles acquire a positive charge and are constantly repelled or "bounced" along by the electron layer. They finally lose their energy when they reach the dark side of the moon or a mountain's shadow.

This process has been going on since the moon formed a few billion years ago, the scientists suggested at the American Geophysical Union meeting in Washington, D. C.

The electron layer is very dense up to three feet above the moon's surface, averaging between 100,000 and 1,000,000 electrons per cubic centimeter. The total layer is about 45 feet thick but the electron strength becomes very weak farther away from the surface.

• Science News Letter, 79:262 April 29, 1961

Frozen Layer on Moon

➤ A FROZEN LAYER nearly one-half mile thick probably lies 100 feet beneath the surface of the moon, Dr. Thomas Gold, a Cornell University scientist, reported.

Radio waves penetrating into the moon's interior show that water is bottled up as ice crystals in rock pores, forming a frozen ground layer, the scientist told the American Geophysical Union meeting in Washington, D. C. The water originally came from water molecules in rock material that formed the moon a few billion years ago.

The frozen covering prevents any water in the moon's interior from reaching the surface and evaporating. Occasionally, a crack or break appears in the covering that causes "humps" on the moon's surface. This action is similar to the "frost heaves" that ruin United States roads during a cold wave.

The temperature extremes of day and night on the moon have little or no effect on the frozen layer because of its 100-foot depth, Dr. Gold said. The rate of evaporation at that depth is very low.

Future astronauts will be able to get drinking water by drilling into the layer and heating the layer to melt the ice crystals locked in the rock.

"If large amounts of water are trapped beneath the moon's surface, this would account for its low density," Dr. Gold said. Beneath the frozen layer, or "ice table," the moon's interior probably becomes progressively warmer.

The radio waves that probed the moon's interior came from U. S. transmitters and were picked up by U. S. radio telescopes, the scientist said. The waves ranged from four inches to three feet.

• Science News Letter, 79:262 April 29, 1961

Naming Moon Features

➤ AN INTERNATIONAL system of naming the moon's surface features has been proposed by one German and two United States scientists.

The new system is purely descriptive and would eliminate any possible prejudice that might arise from the present naming method, the scientists told the American Geophysical Union meeting in Washington, D. C. They are Dr. K. von Bulow of the University of Rostock, Germany, Dr. G. C. Amstutz of the University of Missouri School of Mines and Metallurgy, Rolla, and Dr J. Green of North American Aviation, Inc., Downey, Calif.

The present names for some features of the moon imply a volcanic or meteoric origin. The proposed system would permit an objective evaluation of how the surface features actually formed, and also advance the "basic concepts and theories on the structure of the moon and the planets," the scientists said.

The moon is subdivided according to size, shape and location of the moon features under the new system. It includes both purely geometric terms such as ring, line and wall, and descriptive terms such as continent, mountains or rays. Terms suggesting volcanic craters or meteor scars are omitted.

Scientists are currently divided into two schools as to how the moon's surface features formed. Some believe the wrinkles and valleys formed when the moon cooled from a hot, molten mass, whereas others stress the irregularities are due to meteorites pelting the moon.

• Science News Letter, 79:262 April 29, 1961

BIOLOGY

Origin of Life Theory

➤ SOME OF THE SIMPLE chemicals contained in comets have been used to reinforce one of the theories of the origin of life.

Dr. J. Oro of the University of Texas mixed a solution of hydrogen cyanide, ammonia and water and for the first time isolated a compound called adenine, which scientists agree is basic to life everywhere on earth.

Dr. Oro reported his work to fellow biologists at the meeting of the Federation of American Societies for Experimental Biology in Atlantic City. Adenine is necessary for the structure and the function of genes, for energy metabolism and for a host of other biochemical functions.

It belongs to a family of nitrogen-containing compounds called purines. It is known to be one of the four bases scattered repeatedly but systematically along the nucleic acid molecule, and is thus believed to play a crucial part in the transfer of genetic information.

"Nobody till now has obtained purines from such simple compounds," Dr. Oro said. He told of having let a mixture of hydrogen cyanide, ammonia and water stand for about a day at room temperature and of then isolating adenine as well as a precursor of the same compound from the solution that resulted.

Hydrogen cyanide, ammonia and water are often theorized to have been present on the primeval earth, and through the passage of millions of years to have converged and combined into the kind of organization required for the origin of life.

"We also found the amino acids glycine, alanine and aspartic acid," Dr. Oro said, "and we're looking for guanine, which is related to adenine, and for nucleosides."

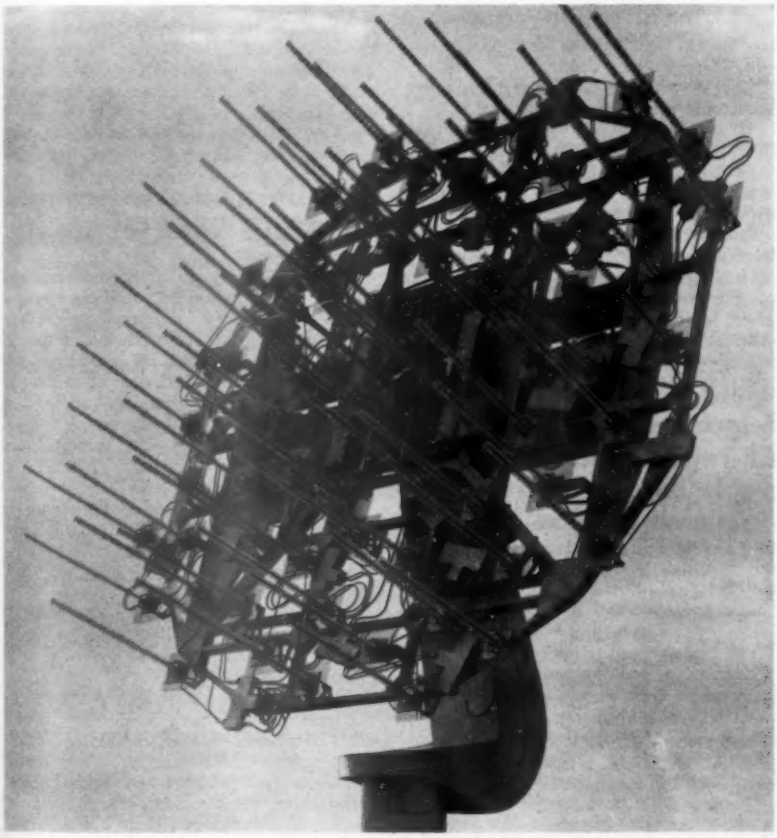
Amino acids are the units from which are built the thousands of different proteins in living things. There are about 20 in all, arranged repeatedly, depending on the kind of protein.

Guanine is also part of the nucleic acid molecule. The nucleosides are simply what is left after the long molecule of nucleic acid is broken down. They consist of only the one nitrogen base attached to a molecule of sugar. Comets are known to have been traveling seemingly aimlessly through space for millions of years. So, according to Dr. Oro, they might be strong hints of what the earth resembled long time ago.

The aim of scientists working on the origin of life is to implicate simple primeval compounds into an evolutionary scheme. The organization implied in evolution demands the presence of enzymes, long protein molecules that control the thousands of reactions of metabolism.

"The next step in our work would be to isolate a polypeptide with enzyme properties," Dr. Oro said, "then look for organization." But he admitted that duplicating organization was possible only in the far future.

• Science News Letter, 79:263 April 29, 1961



FOR UNMANNED TRACKING—The modular construction Avien-Bogner antenna will be used at the first unmanned tracking station to be built this year. Designed by Avien, Inc., Woodside, N.Y., it will be used for telemetry reception of high speed, low flying vehicles.

Brain Chemicals Studied

➤ BIOLOGISTS are taking some close looks at the mysterious chemistry of the brain.

Canadian biologist, Dr. William C. McMurray of the University of Western Ontario, has singled out for study the little understood phospholipids. These compounds, also called phosphatides, are distributed in varying concentrations in the gray and white matter of the brain and are believed to play important roles in the structure and metabolism of the brain.

Dr. McMurray studied the amounts of two types of phosphatides, the lecithins and myelins, in the brains of growing rates. The lecithins are found mostly in the gray matter of the brain, where thought processes are believed to take place; the myelins are located in the outer white matter, which scientists say functions as an electrical insulator.

"We are trying to find out something about the role of these phosphatides in the metabolism of protein," said Dr. McMurray, "with the hope of understanding the enzyme system in the developing brain."

For example, he explained, the myelins might also be necessary for maintaining the structure of the white portion of the brain, which is made up mostly of protein. Since it is thought that metabolism is related to the structure of tissue, the myelins may maintain the proper structure for growth to occur.

The amount of both the lecithins and myelins were highest during the early stages of growth, when the enzyme systems were most active, and dropped off as the rat reached maturity.

Both phosphatides are needed for proper brain function, scientists agree. A deficiency of lecithin results in serious impairment of energy metabolism throughout the body—the patient tires easily. Myelin deficiency causes the vicious nerve disease, multiple sclerosis.

A unique feature of the phosphatides, said Dr. McMurray, is their solubility in water and fat. This property makes them adaptable to either a water or fat environment—the protoplasmic medium.

He reported his findings at the meeting of the Federation of American Societies for Experimental Biology in Atlantic City.

• Science News Letter, 79:263 April 29, 1961

ASTRONOMY

Nearby Stars Yield "Fossil Record"

➤ A "FOSSIL RECORD" has been discovered that may hold the key to determining the rate at which stars are formed in the Milky Way galaxy of which the sun and its planets are a part.

The record was found in a group of unspectacular nearby stars by the astronomer, Dr. Olin C. Wilson of Mt. Wilson and Palomar Observatories, Pasadena, Calif. The stars are small, comparativedy cool, stable and very slowly evolving. Dr. Wilson studied photographs of their light as spread out by the device known as a spectroscope.

Although all the stars whose light he examined are within 30 light years, or about 180 trillion miles, of the earth, only a few are bright enough to be seen with the unaided eye.

Because all of them are in the early stages of stellar evolution and are of similar type and size, they were believed to be of similar age. But Dr. Wilson found evidence suggesting that there are great differences in their ages, perhaps several billion years.

They can be of differing ages and at the same time be in the early stages of evolution, because, although smaller than the sun, the temperature and pressures within these stars are comparatively low. As a consequence, the nuclear fires that determine their rate of evolution burn very slowly, Dr. Wilson reports in the Astrophysical Journal, 133:457, 1961.

The older ones age so slowly they do not show it, remaining in what Dr. Wilson calls "mint condition."

• Science News Letter, 79:264 April 29, 1961

ROCKETS AND MISSILES

Suburb Has Largest Field Free From Magnetism

➤ A WASHINGTON SUBURB boasts one of the world's largest fields free from magnetism, a testing ground for magnetism and radiation measuring United States satellites.

The field, part of the magnetic research area of the U. S. Naval Ordnance Laboratory, Silver Spring, Md., has been used recently to check out the S-3 energetic particles satellite, first piece by piece and finally as an assembled unit.

A project of the National Aeronautics and Space Administration, the S-3 is designed to measure the earth's magnetic fields and the cosmic rays and energetic particles trapped in the Van Allen radiation belts encircling the earth.

The accuracy of these measurements by the satellite cannot be assured until its own built-in magnetic influences, such as those created by its electronic system, have been precisely measured.

The magnetic measurements on the S-3 were made at the Ordnance Laboratory in a specially designed building as free from magnetism as scientists can make it. It is constructed entirely from such nonmagnetic materials as wood, building mortar from which the sand was screened to exclude minute particles of iron oxide, plastic floor drains, aluminum light switches. The nails holding the isolated structure together are copper.

The natural terrestrial magnetic field is cancelled out to create a complete nonmagnetic area by sending electrical current through a system of coils constructed in the building's walls.

Final tests of the S-3 will include calibration of the satellite's magnetometer, a magnetic-measuring probe extending about three feet from the vehicle's body.

When launched this summer, the S-3 will be in an eccentric orbit varying from 150 to 40,000 nautical miles from the earth. On its outward swing away from earth, the S-3 will travel far enough for its measuring probe to be clear of the Van Allen radiation belts and magnetic influence so that another "clean-measuring sweep" can be made.

• Science News Letter, 79:264 April 29, 1961

GENETICS

Intelligence Is Result Of Chemical Products

➤ INTELLIGENCE is the product of many chemical processes, all under genetic control, Dr. Barton Childs of Johns Hopkins University School of Medicine said at the meeting of the American Academy of Pediatrics in Washington, D. C.

But relatively little is known about genetics in intelligence, the pediatrician said. "Genes don't determine the characteristics of what we can study directly. We need some means of measurement."

All intelligence tests have faults, Dr. Childs said. There are sex differences in the results of the tests, partly because they have been devised by men. If women had devised the tests, they might be different.

People tend to marry people of equal intelligence and adopted children have IQ's, or intelligence quotients, like their foster parents rather than their own parents. There is an admixture of cultural influences on intelligence.

• Science News Letter, 79:264 April 29, 1961

PSYCHOLOGY

Sugarless Sweetener Changes Blood Sugar

➤ WHEN YOU EAT a sugarless sweetener it may have an effect on the sugar level in your blood. The action is psychological, not just chemical, Dr. Albert A. Branca of the University of Delaware reported to the Eastern Psychological Association in Philadelphia.

The explanation, he said, is conditioning. When you become accustomed to experiencing a sweet taste when you eat sugar, the sweet taste alone becomes enough to set in motion the physiological events that ordinarily follow eating sugar. Insulin is released in the body. There is greater utilization of glucose and decreased glycogen breakdown. The end result is a lowering of blood sugar. Thirteen out of 14 normal students studied by Dr. Branca had lowered blood sugar after drinking a solution of sugarless sweetener.

• Science News Letter, 79:264 April 29, 1961

IN SCIENCE

OCEANOGRAPHY

Ocean-Bottom Layer Thinner Than Estimated

➤ THE SOFT sediments resting on the ocean floors may be much shallower than scientists once believed.

Measurements taken while drilling through the soft layer show that its average estimated thickness of 550 feet is too high, Willard Bascom, project director of the Mohole drilling program, reported in Washington, D. C. Seismologists had based this estimate on the velocity of sound waves through the layer.

Direct measurements in the well hole showed that sound actually traveled 1.3 miles per hour instead of the estimated one mile. The soft sediment layer represents a geologic span of 60,000,000 to 100,000,000 years.

The measurements were part of a drilling program known as Project Mohole, the eventual goal of which is to penetrate the earth's crust to the dense underlying rock mantle. The total cost of the program may run as high as $15,000,000, Mr. Bascom said. A drilling rig that will make the final thrust to the earth's interior mantle is now on the drawing table.

• Science News Letter, 79:264 April 29, 1961

MEDICINE

Newborn Infants Harmed By Drugs Safe for Adults

➤ NOVOBIOCIN, an antibiotic used to control a staphylococcal outbreak in an unnamed newborn nursery, caused an epidemic of apparent jaundice among the infants, two Cincinnati researchers report.

This is "one more example of the harm which may befall newborn and premature infants from the administration of a drug known to be safe for older subjects," an editorial in the American Journal of Diseases of Children, 101:411, 1961, states.

Dr. James M. Sutherland and William H. Keller of the University of Cincinnati report that one infant who received novobiocin died. Others got jaundice, but recovered (p. 447).

In experiments on newborn rats, the scientists also found a yellow skin discoloration following large doses of novobiocin.

Death, blindness and brain damage have resulted from untested administration to full-term or premature infants of certain other substances in addition to the newly discovered novobiocin danger.

The dangers from oxygen, sulfisoxazole, sulfadiazine, chloramphenicol and vitamin K were discovered by chance, the editorial pointed out. Drug houses and research laboratories have always tested new drugs, but usually only on animals and adult humans.

• Science News Letter, 79:264 April 29, 1961

E FIELDS

MEDICINE

"Moth-Eaten" Junctions In Myasthenia Patients

➤ IN PATIENTS with myasthenia gravis, a disease in which the muscles become progressively weaker, the junctions between nerves and muscles have a "moth-eaten" appearance when viewed under an electron microscope, scientists report.

Drs. S. I. Zacks, W. C. Bauer and J. M. Blumberg, working at the Armed Forces Institute of Pathology in Washington, D. C., have magnified the neuromuscular junctions of such patients 16,000 to 24,000 times and found that they appear to be abnormal in two ways.

The endplates, or jumping off place for a nerve impulse, are extensively disorganized, the investigators report. Certain parts of the nerve cell, the axon filaments, are shrunken and there are fewer of the finger-like projections known as secondary synaptic clefts. Those that remain are wider and more club-shaped than normal.

The second abnormality is that certain areas of the junction do not have the dense concentration of electrons seen in the normal state.

Myasthenia gravis long has been considered an impairment of conduction at the neuromuscular junction, but until now visible differences had not been noted. Just what each of these changes means in terms of muscle weakness is not now known, the scientists report in Nature, 190:280, 1961.

• Science News Letter, 79:265 April 29, 1961

BIOLOGY

Reptiles May Harbor Encephalitis Virus

➤ A CANADIAN scientist has found that the snakes, turtles, lizards and alligators of Okefenokee Swamp may be a virtual hotbed for encephalitis virus in the wintertime.

Eastern encephalitis, a disease usually confined to wild and domestic animals but sometimes found in man, may cause a high fever, paralysis or palsy, coma, delirium or abnormal heart function. About 50% of the children who get it die, and the infants who survive often suffer mental deterioration. Until now, scientists had few clues as to where the virus spends the winter.

Dr. Lars Karstad of Ontario Veterinary College in Guelph, Canada, has found that a number of the reptiles in the famed Georgia swamp have antibodies to the virus in their blood, an indication that the animals had been infected naturally. When the virus was injected into the animals, it spread through their bodies very fast and the infection lasted as long as 42 days, long enough to survive the winter.

He also found that reactions in individual reptiles varied widely. Some built up no antibodies at all after infection with the virus, while others showed rapid rise in antibodies. Some of the reptiles could be reinfected and had the disease all over again.

Dr. Karstad reported at the 26th North American Wildlife and Natural Resources Conference meeting in Washington, D. C., that no one knows which insects may be carrying the disease from the reptiles to birds and mammals.

• Science News Letter, 79:265 April 29, 1961

MEDICINE

Fatal Heart Attacks in "Hearts Too Good to Die"

➤ A REASON why fatal heart attacks occur in "hearts too good to die" is proposed in the Journal of the American Medical Association, Vol. 176, 1961.

No recent heart damage was found in 316 out of 500 heart attack victims on whom autopsies were performed, Drs. Lester Adelson and William Hoffman of Western Reserve University School of Medicine, Cleveland, reported (p. 129).

When varying degrees of coronary narrowing produce different amounts of oxygen in different parts of the heart muscle, they said, this can create an electrical disturbance of sufficient magnitude to cause a fatal convulsive heart beat.

If a physician is present when such heart attacks occur, he may be able to revive the patient with cardiac massage, electrical defibrillation, or both, in association with artificial respiration, the scientists said.

The substitution of radiation treatment for surgery in patients with complicated duodenal ulcer has produced encouraging results, two other Cleveland physicians reported in the same journal.

Drs. Harold C. Klein and Norman E. Berman of Mount Sinai Hospital said 39 out of 50 patients treated with radiation were "cured' of their ulcer disease. Of the remaining patients, five avoided surgery, while six had to undergo operations (p. 98).

• Science News Letter, 79:265 April 29, 1961

SEISMOLOGY

Earthquake Recorded by Ocean Floor Instrument

➤ AN EARTHQUAKE has been recorded for the first time by an instrument placed on a deep ocean floor.

A seismograph resting on the Atlantic Ocean floor 120 miles from Bermuda recorded the earthquake at a depth of approximately three miles below the surface, Columbia University scientists said.

More sensitive recording of earthquakes and new knowledge of underwater sound transmission will be possible with the new missile-shaped instrument, John Ewing, Columbia University geophysicist and director of the project, said.

The spiked missile seismograph was built at Columbia's Lamont Geological Observatory.

• Science News Letter, 79:265 April 29, 1961

BACTERIOLOGY

Soil Specimens Yield Blastomyces Dermatitidis

➤ FOR THE FIRST TIME, *Blastomyces dermatitidis*, a species of fungus causing chronic infection that may be fatal, has been isolated from soil.

Although soil has been found to be the natural habitat for many of the fungi causing disease in man, all previous efforts to isolate this particular fungus from this source have failed.

The soil that yielded the positive specimen was collected in a tobacco-stripping barn near Lexington, Ky., in which a dog had died of blastomycosis two years previously. The soil sample was examined by means of a new technique at the Medical College of Georgia, Augusta.

Dr. J. Fred Denton, Medical College of Georgia, Dr. E. S. McDonough, Marquette University, Milwaukee, Wis., Dr. Libero Ajello, Communicable Disease Center, Atlanta, Ga, and Dr. Robert J. Ausherman, Del Tor Clinic, Lexington, Ky., report their findings in Science, 133:1126, 1961.

• Science News Letter, 79:265 April 29, 1961

GEOLOGY

New Timetable Made Of Earth's History

➤ A MORE ACCURATE timetable of the earth's history is now available.

The stages of evolution of plants and animals contained in earth's "book of sediments" can be dated more accurately with this revised geological time scale.

New evidence of rock ages resulting from the highly refined dating methods of rubidium and potassium "atomic clocks," and improved techniques of other dating methods, caused the revamping of the geological time scale, a calendar that stretches back through history at least 600,000,000 years.

Dr. J. Laurence Kulp, director of the geochemistry laboratory at Columbia University's Lamont Geological Observatory in Palisades, N. Y., reports the changes in Science, 133:1105, 1961.

The atomic clock dating of rocks measures the amount of radioactive decay of an element in a mineral. Because the decay follows a definite pattern, the age can be determined by the amount of the radioactive isotope residue.

Granite from Russia, sandstone from California and shale from Germany were dated by scientists. Dr. Kulp combined all the latest work of these scientists in presenting the new time scale.

The Mesozoic era, the age of reptiles when dinosaurs thundered over the earth, began about 230,000,000 years ago and ended 63,000,00 years ago. However, the dim beginnings when life first began on the earth is still unknown.

Earlier estimates on the ages when certain animals or plants predominated on the earth were fairly close to the present scale, Dr. Kulp notes.

• Science News Letter, 79:265 April 29, 1961

NUTRITION

The Food for Peace Frontier

Instead of calling attention to disposal of U.S. surpluses, the Food for Peace Program is emphasizing adequate diet as an approach to foreign policy, Faye Marley reports.

➤ THE KENNEDY administration is overhauling the United States Food for Peace program.

Wheat for many years has been a surplus commodity, expensive to store, to ship, to curtail. Surplus was disposed of by sending it overseas.

Now an attempt is being made not only to share our abundance but to provide nutritional "expanders" as a basic approach to foreign relations.

As a beginning, George McGovern, director of the new Food for Peace program, requested Secretary of Agriculture Orville L. Freeman to authorize oil purchases for overseas donations.

Secretary Freeman has already announced plans to buy up to 100,000,000 pounds of refined vegetable oils to be given to needy persons in various countries. Distribution will be made through some 20 United States religious and charitable agencies.

Adds High Energy Food

The Department of Agriculture was already donating flour, corn meal, rice and non-fat dry milk to the voluntary agencies. But Secretary Freeman said the addition of the oils would add a concentrated high-energy food to the diets of the needy and at the same time would give variety and needed nutritional supplements to their meals.

The new approach—that adequate diet is essential to the prompt stabilization of new governments and new nations and a necessary foundation stone for their future economic development—has turned up a surprising fact: In many foodstuffs, particularly proteins, the U.S. has deficits rather than surpluses.

These facts were brought out in the report of the Food for Peace Committee appointed by President Kennedy when he was still a Senator.

"The most important single recommendation of our Committee," the report stated, "is that our Government should make this deliberate change in the emphasis and direction of our Food for Peace program.

"Inevitably this will require adjustment in production and marketing policies. Ultimately, however, such adjustments may well have the effect of expanding commercial markets overseas for a wider range of American agricultural products."

Mr. McGovern said he would like to see the U.S. think of the Food for Peace program as a positive instrument of foreign policy.

"When I think of the disposal operation," he said, "I think about this little gadget in our sink at home where we get rid of the garbage and this is not the proper view when we talk about the feeding of human beings who are hungry."

Mr. McGovern likes to tell the story of his first experience with the hungry when he was a bomber pilot with the Fifteenth Air Force in southern Italy.

"At Foggia we used to awaken in the morning to the sounds of Italian housewives out scratching around in the garbage dump behind our squadron area looking for food that they could take home to their children."

Mr. McGovern recalled the memory of Italian children tugging at his trousers in a plea for chocolate that was not a luxury but something to answer their need for food.

Food and peace, he said, are two of the most precious words in our vocabulary. There is no peace in a world of hungry people. Economic and physical foundations are what peace depends upon.

In his new job as director of the administration's Food for Peace program Mr. McGovern went to Brazil and Argentina on a mission aimed at doing something about hunger. He recalled seeing a family with seven or eight children in Brazil. They were eating dried cereal because it was the only food in their hut. Two of the children had measles, with little chance of survival because they were so undernourished.

Mr. McGovern also visited a village in which the life span averaged 30 years.

To meet that kind of challenge, he said, we have Food for Peace.

Khrushchev Wanted Secret

Mr. McGovern, a former Iowa Congressman, said when Khrushchev visited Iowa he wanted to know the secret of the amazing productivity of the farmers. He asked no questions about the surplus.

Instead of looking at our surplus as a burden, Mr. McGovern said, quoting President Kennedy, let us look at it as an opportunity to meet one of our most serious problems—hunger. Let us move toward a positive use of abundance.

Asked about the United Nations' Food and Agriculture Organization's Freedom from Hunger campaign, Mr. McGovern said he had met with Dr. B. R. Sen, FAO's director-general. The U.S. Food for Peace program should not be limited by

AMERICA'S ABUNDANCE—Combines harvest a bumper wheat crop in Nebraska. The United States could have a complete failure of wheat harvests for a year and still eat.

the FAO campaign but should give it more thrust, he said.

The FAO Council is considering methods by which present programs for moving surplus food can be improved. At the request of the U.S. delegation, the UN is studying what new techniques can be developed to add to the use of surpluses. FAO findings and recommendations are to be reported to the UN Economic and Social Council in June, 1961.

The Food for Peace Committee said the U.S. is not producing enough oils and fats, meats, butter, non-fat milk, soy beans, peas and other agricultural commodities aside from grains to sustain adequate diets either for our needy at home or for the needy abroad.

"To realize the aim of putting U.S. agricultural capacity to the fullest use to meet human needs and at the same time secure a fair return to the farmer," the committee said, "it will be necessary to bring about shifts in production from wheat and corn into the oils and fats and protein foods needed for a nutritional diet."

The feeding and clothing of the U.S. needy has priority over any overseas program. The program to assist those in economically distressed areas of the U.S. is being carried out by administrative action under existing law, although in some cases new interpretation of the law may be required.

Appropriations to carry out the provisions of Public Law 480 (the Agricultural Trade Development and Assistance Act of 1954) are due to come before the present session of Congress. Some of the law's most important financial authorizations expire on Dec. 31, 1961.

The Food for Peace Committee recommends a thorough revision of PL480 "to transform it from a surplus disposal act to a Food for Peace Act." Among the committee's recommendations for the revised law is authorization to the President to use or dispose of foreign inconvertible local currencies accruing to the U.S. under PL 480 operations.

"The steady accumulation of large amounts of inconvertible foreign currencies (allowed by Title I for purchase of commodities) is placing great and increasing burdens on the United States foreign relations and holds potentialities which are highly dangerous," the committee said.

"It is important for the Government, the Congress and the American people to recognize that these local currencies are assets that are usable only in the countries of issue, with the agreement of the countries of issue; that they are not substitutes for dollars; and that they should not be subjected to the appropriations process."

The Food for Peace program is a cooperative effort of a number of agencies, chief among them the Department of Agriculture, the Department of State and the International Cooperation Administration. The Export-Import Bank and the Development Loan Fund also are involved.

Mr. McGovern is charged with planning and coordinating the program. He reports directly to President Kennedy.

GEOPHYSICS

World-Wide Haze Found In Upper Atmosphere

► A WORLD-WIDE layer of "haze" in the upper atmosphere has been discovered by U. S. Air Force scientists.

The three-mile thick shell completely surrounds the earth about 11 miles out in space, Dr. C. E. Junge, C. W. Chagnon, and J. E Manson of the Geophysics Research Directorate, Air Force Cambridge Research Laboratories, reported in Washington, D C. The layer probably explains certain atmospheric effects observed during twilight hours.

The "hazy" layer was measured for the first time when balloons and aircraft sent aloft for atomic fallout studies collected air samples that contained an unusual concentration of particles at certain altitudes.

The particles were mostly ammonium sulfate crystals with some silicon and iron. Scientists believe the crystals form when gases such as hydrogen sulfide or sulfur dioxide drift upward into the upper atmosphere and are chemically changed by the bright sunlight of ozone, a form of oxygen.

Microscopic meteorites entering the atmosphere probably add to the silicon and iron impurities, the scientists stated.

The layer could produce the so-called "purple light" seen during twilight just after sunset or before sunrise. The hazy layer would scatter the fading rays of light to produce the atmospheric quirk.

IMMUNOLOGY

Radioactive Tracers Reveal Life Processes

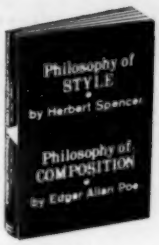
► RADIATION is revealing important knowledge about life processes.

It is being used with great success in studying how bacterial cells make proteins. Proteins or enzymes are the chemical machines that set in motion all the many processes occurring in living cells. They are responsible for converting food into energy and new cell substance.

Dr. G. David Novelli, biology division, Oak Ridge National Laboratory, Oak Ridge, Tenn., told the Joint Congressional Committee on Atomic Energy that the use of radioactive tracers have revealed how a specific protein is formed.

Proteins are large molecules built of 20 different building blocks called amino acids. The sequence of arrangement of amino acids in a given protein is very exact. Radioactive carbon-14 was the tracer used to label amino acids to study the manner by which cells arrange their sequence.

Radioisotopes also have been used in the study of the phenomenon of immunization. These studies, described by Dr. Frank J. Dixon, chairman of department of pathology at the University of Pittsburgh School of Medicine, investigate how antigens, foreign substances, react in an individual to develop immunity.



IF YOU WRITE FOR MONEY!

Enrich your writing by applying Herbert Spencer's and Edgar Allan Poe's classic principles that have inspired many of the world's greatest authors. Indispensable if you want to get published! Send $1.00 to

PAGEANT PRESS
Dept. SN
101 5th Ave., N.Y.C. 3.

HACKMANITE—Chameleon of Minerals

IT'S SOLID MEN! (from Solid State Physics, that is.)

Send $2.00 or $3.00 for a piece of this fascinatingly interesting mineral with its varied physical properties. 1) Fluorescence, 2) Thermoluminescence, 3) Reversible Photosensitivity. How? Why? When? Literature free with each mineral sample purchased.
Hackmanite specimen according to size, $2.00 or $3.00 p.p. with free instructions.

HARRY ROSS *Scientific & Lab Apparatus*
61-L Reade St., N.Y. 7, N.Y.

BIND and SAVE Your SNL's

All 52 issues of SNL, for a full year can be permanently filed in these sturdy buff-colored, buckram binders.
Each issue snaps into the cover with a metal strip. Only $4.00 complete. Postpaid.
Order now, from

SCIENCE NEWS LETTER
1719 "N" N.W. Wash. 6, D.C.

USED AND APPROVED BY LEADING UNIVERSITIES

Model RV-6
6-INCH DYNASCOPE
Reflecting Telescope

includes these features:
- Electric Drive
- Rotating Tube
- Setting Circles

Only **$194.95**

F.O.B. Hartford
Shipping Wt. 50 lbs. Express charges collect

Easy Terms Available!

Completely Portable! Entire telescope dismantles in minutes for easy carrying.

Finest American-made 6-inch reflector in its price range! Save $100 or more, yet get all these fine features. f/8 6-inch mirror accurate to ¼ wave • 3 matched eyepieces (75X, 150X, 348X) • 6 x 30 Achromatic finderscope • Heavy-duty mount with setting circles • Rack & Pinion eyepiece holder • Sturdy lightweight tripod.

CRITERION MANUFACTURING COMPANY
Dept. NL-85, 331 Church St., Hartford 1, Conn.

——FREE FACTS! MAIL COUPON!——

Criterion Manufacturing Company
Dept. NL-85, 331 Church St., Hartford 1, Conn.
☐ Under your unconditional guarantee, please ship me promptly the RV-6 DYNASCOPE. My payment of $194.95 is enclosed.
☐ Please send FREE LITERATURE on the RV-6 Dynascope and your other DYNASCOPES priced as low as $49.95.
Name.....
Address.....
City.....State.....

• Books of the Week •

For the editorial information of our readers, books received for review are listed. For convenient purchase of any U. S. book in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 N Street, N.W., Washington 6, D. C.

ABC's OF COMPUTERS—Allan Lytel—*Bobbs*, 128 p., illus., paper, $1.95. To serve as self-teaching basic introduction to digital and analog computers.

ACCEPTED DENTAL REMEDIES, 1961—*Am. Dental Assn.*, 26th ed., 230 p., paper, $3. Drugs used in dental practice, including a list of brands accepted by the Council on Dental Therapeutics of the A.D.A.

ATOMIC ENERGY: The Story of Nuclear Science, Including Many Home Experiments—Irene D. Jaworski and Alexander Joseph—*Harcourt*, 218 p., illus., $4.95. Explains the nature and structure of the atom, fission, fusion and peaceful uses of atomic energy for the young adult.

BASIC MATHEMATICS, Vol. 1: Arithmetic as an Outgrowth of Learning to Count—Norman H. Crowhurst—*Rider, J. F.*, 143 p., illus., paper, $3.90. Step-by-step arithmetic, grade-school level.

BATTLE FOR THE MIND: A Physiology of Conversion and Brain-Washing—William Sargant—*Penguin*, 255 p., illus., paper, $1.45. Examines some of the mechanisms involved in the fixing or destroying of religious or political belief in the human brain.

THE BIBLICAL ARCHAEOLOGIST READER—David Noel Freedman and G. Ernest Wright—*Doubleday*, 342 p., illus., paper, $1.45. Collection of articles published by the American Schools of Oriental Research, selected for the general reader.

THE BIOCHEMISTRY OF INSECTS—Darcy Gilmour—*Academic*, 343 p., $8. Summary of the literature on the life processes of insects at the biochemical level, for entomologists and those engaged in the field of insecticide toxicology.

CALIFORNIA SPRING WILDFLOWERS: From the Base of the Sierra Nevada and Southern Mountains to the Sea—Philip A. Munz—*Univ. of Calif. Press*, 122 p., 96 color photographs, 173 drawings, paper, $2.95. Handsome and authoritative guide to identification.

THE COSTLY TIME LAG BETWEEN DISCOVERY AND USE OF MEDICAL KNOWLEDGE—*Public Health Service*, 20 p., illus., paper, single copies free upon request direct to publisher, Washington 25, D. C. Facts about loss in life and health resulting from failure to use new research findings.

DRUG ADDICTION: Crime or Disease? Interim and Final Report—Joint Committee of the American Bar Association and the American Medical Association on Narcotic Drugs, introd. by Alfred R. Lindesmith—*Indiana Univ. Press*, 173 p., paper, $2.95. Report's recommendations have been opposed by the Federal Bureau of Narcotics.

EDUCATION DIRECTORY, 1960-1961, Part 2: County, City and Other School Superintendencies—Rudolph V. Thompson—*Office of Educ. (GPO)*, 210 p., paper, 75¢.

ELECTRICITY AND ELECTRONICS BASIC—William B. Steinberg and Walter B. Ford—*Am. Tech. Soc.*, 2nd ed., 262 p., illus., $4.50. Discussions of basic principles are followed by work projects labeled "Interesting Things to Do."

ELEMENTARY LOGIC OF SCIENCE AND MATHEMATICS—P. H. Nidditch—*Free Press*, 371 p., $4. Introductory textbook of inductive and of modern deductive logic.

ELEMENTS OF MODERN PHYSICS: A Course in Those Aspects of Modern Physics That Underlie Important Engineering Developments—Paul L. Copeland and William E. Bennett—*Oxford Univ. Press*, 507 p., $8.50. One-semester survey course for engineering students.

ENGINEERING MANAGEMENT—Struan A. Robertson—*Philosophical Lib.*, 2nd ed., 467 p., $10. British textbook.

ESSENTIALS OF HUMAN ANATOMY—Russell T. Woodburne—*Oxford Univ. Press*, 2nd ed., 620 p., 413 illus., $12.50. Revised edition includes ten full-color plates illustrating central anatomical features of each region of the body.

EXPLORATIONS IN THE PHYSIOLOGY OF EMOTIONS—Louis Jolyon West and Milton Greenblatt, Eds.—*Psychiatric Res. Reports, Am Psychiatric Assn.*, 271 p., illus., paper, $2. Papers and discussions of interdisciplinary symposium at University of Oklahoma in 1957.

FAMOUS INDUSTRIALISTS—Sigmund A. Lavine—*Dodd*, 157 p., illus. by Gerald McCann, $3. Juvenile biographies.

GEOGRAPHICAL GUIDE TO FLORAS OF THE WORLD, Part II: Western Europe—S. F. Blake—*U.S. Dept. of Agric. (GPO)*, 742 p., $2.75. Annotated selected list of floras and floristic works relating to vascular plants.

GREECE—Pierre-Jean Launay—*Hastings House*, 126 p., photographs by author, $4.75. Geographical, historical and archaeological notes with 72 pages of illustrations.

A GUIDE TO DISSECTION IN GROSS ANATOMY—Russell T. Woodburne—*Oxford Univ. Press*, 162 p., illus., $3.50. Laboratory guide designed to direct student in an organized dissection of the structures of the body.

HOW TO REPAIR SMALL APPLIANCES—Jack Dart—*Bobbs*, 128 p., illus., paper, $2.50. Practical tips on how to take apart and repair 15 appliances, from toasters to small electric motors.

THE INTERNATIONAL DICTIONARY OF PHYSICS AND ELECTRONICS—Walter C. Michels, Ed.-in-Chief—*Van Nostrand*, 2nd ed., 1355 p., illus., $27.85. Enlarged and revised, now includes recent developments in controlled fusion and magnetohydrodynamics, nuclear physics and astrophysics, comprises terms of pure science as well as those of its applications. New multilingual index in French, German, Russian and Spanish.

INTERNATIONAL TRANSISTOR SUBSTITUTION GUIDEBOOK—Keats A. Pullen, Jr.—*Rider, J. F.*, 64 p., diagrams, paper, $1.50. Compact listing of 4500 direct substitutions of American and foreign manufacture.

INTRODUCTION TO SYMBOLIC LOGIC—A. H. Basson and D. J. O'Connor—*Free Press*, 175 p., $3. Textbook for the beginner in formal logic, with exercises and bibliography.

INTRODUCTORY BOTANY—Arthur Cronquist—*Harper*, 892 p., illus., $9.25. Text stresses both facts and interpretation, proceeds from the simple algae to the complex angiosperms, and includes results of recent research.

INTRODUCTORY FORMAL LOGIC OF MATHEMATICS—P. H. Nidditch—*Free Press*, 188 p., $3. Course in formal logic and in elementary set theory, giving logically valid proofs of mathematical theorems.

LABORATORY WORKBOOK FOR BASIC PHYSICS—Alexander Efron—*Rider, J. F.*, 208 p., illus., paper, $2.50. Instructive experiments to accompany high school or junior college text.

LOSE WEIGHT AND LIVE—Robert P. Goldman, foreword by Harold Willard, M.D.—*Doubleday*, 235 p., illus. by Roland Rodegast, $3.95. Once overweight medical writer tells how he used nutritional know-how and psychology on himself to change his food habits and figure.

MAN TAKES CONTROL: Cultural Development and American Aid—Charles J. Erasmus—*Univ. of Minn. Press*, 365 p., $6.50. Examines technical assistance programs in relation to cultural development, particularly in northwestern Mexico, where road and irrigation projects have created new opportunities.

MINERAL METABOLISM: An Advanced Treatise, Vol. I: Principles, Processes and Systems, Part B—C. L. Comar and Felix Bronner, Eds.—*Academic*, 541 p., illus., $14.50. Treats the physical and biological principles required for an analysis of metabolism of minerals.

MINIATURE ROSES—Roy Genders—*Blanford (St. Martins)*, 104 p., illus., $3.95. British gardening guide.

MIRAGE OF HEALTH: Utopias, Progress and Biological Change—Rene Dubos—*Doubleday*, 235 p., paper, 95¢. A study of history and concepts of medicine, showing how the ingredients of utopia are often the agents of new disease.

NATIONAL ELECTRICAL CODE AND BLUEPRINT READING—Kennard C. Graham—*Am. Tech. Co.*, 153 p., illus., $4. Pictorial presentation of safety measures and standard practices in electrical wiring.

OF MEN AND NUMBERS: The Story of the Great Mathematicians—Jane Muir—*Dodd*, 250 p., diagrams, $3.50. Short biographies, from Pythagoras to Georg Cantor, showing each mathematician's contributions to modern mathematical thought and how each altered man's view of the universe.

PHILOSOPHIES OF EDUCATION—Philip H. Phenix, Ed.—*Wiley*, 137 p., paper, $1.90. Sketches of some contemporary viewpoints on education.

POPULATION PERSPECTIVES—Philip M. Hauser—*Rutgers Univ. Press*, 183 p., illus., $3.50. Elaboration of three lectures analyzing the revolutionary changes in population size, composition and distribution during the modern era, with particular emphasis on the metropolitan area explosion in the United States.

PROCEEDINGS OF THE SIXTH SYMPOSIUM ON MAGNETISM AND MAGNETIC MATERIALS: Supplement to the Journal of Applied Physics, Vol. 32, 1961—F. Keffer and others, preface by R. M. Bozorth—*Am. Inst. of Physics*, 399 p., illus., paper, $1.75. Among other subjects, on spin

YOUR HAIR

Its Health, Beauty and Growth

By Herman Goodman, M.D.

A medical specialist tells you what to do to save and beautify your hair, stimulate healthier hair growth, and deal with many problems, as: Dandruff—gray hair—thinning hair—care of the scalp—baldness—abnormal types of hair—excessive oiliness—brittle dryness—hair falling out—infection—parasites—hair hygiene—glands—diet—coloring—and myriad other subjects concerning hair.

"Discusses the many problems of hair retention, regrowth and removal."—Science News Letter.

287 pages—PROFUSELY ILLUSTRATED!

Price $3.95, Postfree. 5-Day Money-Back Guarantee

EMERSON BOOKS, Inc., Dept. 247-M

251 W. 19th Street, New York 11

FREE BOOK!

"Dover Science Sampler," 64-page book, with entertaining, instructive selections from Mach, Galileo, Newton, Poincare, Hubble, Steinman, etc. Island universes, fata morgana, genetics, phase rule, etc. Entirely free, no string attached; no obligation, no salesmen will call. Supply limited, write now. Dept SNL. DOVER, 180 Varick St., N. Y. 14, N. Y.

systems and spin configurations, ferro-magnetic resonance, anisotropy, and oxides.

SHE LIVED FOR SCIENCE: Irene Joliot-Curie—Robin McKown—*Messner*, 192 p., $2.95. Biography for young people about the co-discoverer of artificial radioactivity, Nobel Prize-winning daughter of Nobel Prize-winning parents.

A SHORT HISTORY OF TECHNOLOGY: From the Earliest Times to A.D. 1900—T. K. Derry and Trevor I. Williams—*Oxford Univ. Press*, 782 p., illus., $8.50. Emphasizes the underlying relation between man's general history and the history of technological progress, first part leading up to 1750 and the Industrial Revolution, the second describing events to 1900.

THE SOUTH AMERICAN HANDBOOK, 1961—Howell Davies, Ed.—*Trade & Travel (Wilson)*, 37th ed., 867 p., maps, $3. A year book and guide to the countries and resources of South and Central America, Mexico and Cuba.

SPACE IN YOUR FUTURE—Leo Schneider—*Harcourt*, 260 p., illus. by Gustav Schrotter, photographs, $3.75. Introduces boys and girls to the solar system, to galaxies and the tools of the astronomer. Includes list of planetariums and of astronomical organizations in the United States.

STATE PARKS OF CALIFORNIA—John Robinson and Alfred Calais—*Lane Bk. Co.*, 96 p., photographs by J. Robinson, paper, $1.95. Describes location and nature of parks, generously illustrated.

THE USE OF CHEMICALS IN SOUTHERN FORESTS—Robert W. McDermid, Ed.—*La. State Univ. Press*, 152 p., illus., $4. Symposium papers and discussions on the use of chemicals as growth stimulants, as species regulators and for control of destructive organisms in forest management.

VIRUSES AND THE NATURE OF LIFE—Wendell M. Stanley and Evans G. Valens—*Dutton*, 224 p., illus., $4.95. Addressed to young adults, Nobelist presents essential facts known about viruses and about closely related research in genetics.

THE VOICE OF THE DOLPHINS and Other Stories—Leo Szilard—*Simon & Schuster*, 122 p., $3. Satires on contemporary socio-political issues, written by biophysicist of world renown.

WATER: The Mirror of Science—Kenneth S. Davis and John A. Day—*Doubleday*, 195 p., illus., paper, 95¢. Readable analysis of the physical, chemical and biological properties of water, one of PSSC series.

WORKS OF THE INSTITUTE OF HIGHER NERVOUS ACTIVITY: Pathophysiological Series, Vol. I—A. G. Ivanov-Smolenskii, Ed., transl. from Russian—*Acad. of Sciences, USSR (OTS)*, 484 p., $5. Experimental research into higher nervous activity in certain neuropsychotic diseases.

WORLD OF THE WIND—Slater Brown—*Bobbs*, 224 p., $3.95. Tells about the characteristics and effects of winds in various parts of the world.

YOU CAN'T COUNT ON DYING—Natalie Harris Cabot—*Houghton*, 273 p., $3.95. Discusses the problems of the aging, based on case studies and research at the Age Center of New England.

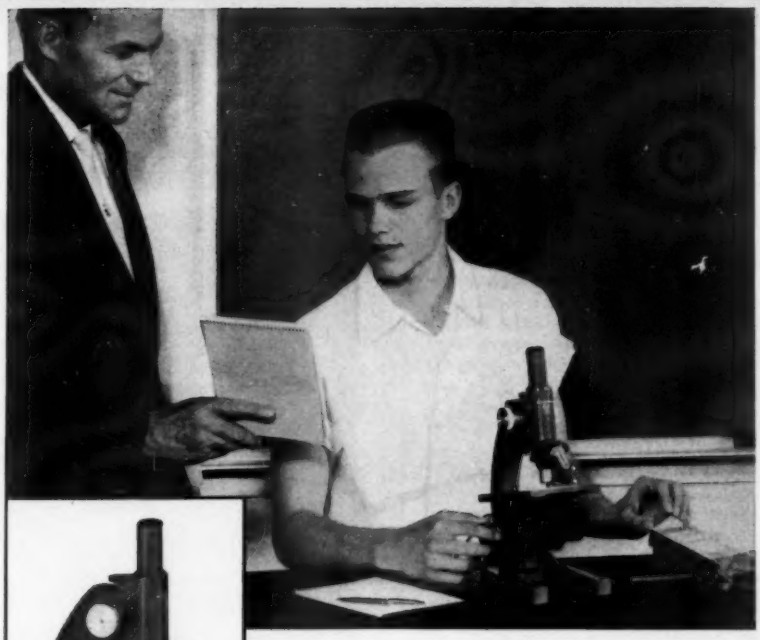
• Science News Letter, 79:268 April 29, 1961

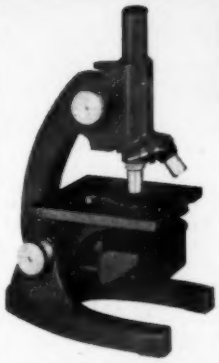
Questions

CHEMISTRY—How was element 103 produced? p. 259.

PHYSICS—How can the idea of "multiple connected" be explained? p. 262.

Photographs: Cover, General Dynamics/Electronics; p. 259, American Telephone and Telegraph Company; p. 261, National Aeronautics and Space Administration; p. 263, Avien, Inc.; p. 266, U. S. Department of Agriculture; p. 270, Cornelia Sales Co.; p. 271, J. M. Wardle.





BAUSCH & LOMB STANDARD TEACHING MICROSCOPES

Standard size and operation, with optics of laboratory microscope excellence.

BAUSCH & LOMB TRI-SIMPLEX MICROPROJECTOR

Projects mounted specimens or living organisms on screen or tracing pad.

BAUSCH & LOMB BUNSEN SPECTROSCOPE

This basic tool of chemical analysis shows spectra of elements.

BAUSCH & LOMB

Costs are far less when you buy Bausch & Lomb!

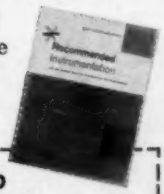
You get extra *years* of use out of this all-time best selling school microscope. And your investment is protected for life.

STANDARD TEACHING MICROSCOPES take all the punishment your students can give them—proved by years of maximum use. And now the new exclusive Bausch & Lomb force-proof clutch and lifetime ball-bearing focus make them even more student-proof!

Like all B&L instruments, they're made in America, to the world's highest standards. They're guaranteed for life against defects in workmanship or materials. A nation-wide network of B&L dealers provides you with prompt service.

That's why it costs you far less to buy B&L.

GET YOUR FREE COPY!
of this data brochure covering the world's finest teaching tools for the balanced science program.



Made in America, to the world's highest standards.

BAUSCH & LOMB INCORPORATED
16016 Bausch Street, Rochester 2, N. Y.

Please send Brochure D-152, "Recommended Instrumentation for Life Science Teaching."

NAME, TITLE .....

SCHOOL .....

ADDRESS .....

New Ideas and Gadgets

For sources of more information on new things described, send a self-addressed stamped envelope to SCIENCE NEWS LETTER, 1719 N St., N.W., Washington 6, D. C., and ask for Gadget Bulletin 1089. To receive this Gadget Bulletin without special request each week, remit $1.50 for one year's subscription.

BATTERY-POWERED SHAVER as small as a pack of cigarettes provides rotary shaving action for comfortable shaves everywhere away from electric outlets. Compact motor operates on only two flashlight batteries. Shaver has a retractable non-kinking cord and comes in case complete with batteries, mirror, brush and a sponge-rubber compartment. Flip-top head flicks open for easy cleaning.

• Science News Letter, 79:270 April 29, 1961

ANTI-GLARE VISOR of plastic with suction cup can be mounted to any spot on windshield or any car window to blot out sun glare. The 5-by-10-inch flexible, opaque plastic panel is easily removed and can be mounted at any angle.

• Science News Letter, 79:270 April 29, 1961

CLOTHES POLE of brass or chrome has hangers that adjust to convenient heights for every member of the family. Equipped with two pairs of double clothes hooks, the floor-to-ceiling pole can support additional hooks so one unit can meet needs of a large family. Non-marring plastic end caps protect ceiling and floor.

• Science News Letter, 79:270 April 29, 1961

BATTERY-POWERED ERASER, shown in the photograph, removes typing, ballpoint, pencil and ink. It uses standard flashlight "C" batteries and works without shields or other devices. It erases one initial or number at a time without marring adjacent characters. Corrects errors on multiple carbon copies without the need for slipsheeting.

• Science News Letter, 79:270 April 29, 1961

BEE HIVE for hobbyists comes complete with bee feeder, a queen bee and 400 worker bees for honey-making and bee-raising at home. A method of mounting the little unit in a window makes it safe, practical and fun for all age groups. Set comes complete with literature and instructions on installation and care.

• Science News Letter, 79:270 April 29, 1961

CARD AND PHOTO PACK in black or antique white leather holds up to 24 cards, photos, etc., in swing-out windows. Only 3 by 4 inches when closed, pack also has two inside pockets and a leather-covered inside spring money clip.

• Science News Letter, 79:270 April 29, 1961

ALUMINUM POST BOOK ENDS hold books, records, folders and magazines upright any place on a shelf. Adjustable from 9 to 13½ inches in height, inside spring action holds rubber-tipped posts steady. They are available in gold or satin black anodized finish.

• Science News Letter, 79:270 April 29, 1961

PLASTIC WORK GLOVES of polyethylene protect hands and products in home and industry. Light and flexible, watertight and very rugged, the gloves are low enough in cost to be disposable. Packed in rolls, there is the proper size, length and weight for every use. The gloves are useful wherever hands need protection and products must be protected from hands.

• Science News Letter, 79:270 April 29, 1961

Nature Ramblings

THAT ANTS keep their own form of cattle, aphids or plant lice is well known. But the industrious ant has domesticated other insects that are less well known to humans because they live in the nests and rarely see the light of day unless a curious naturalist pries them out.

Some of these insects probably should be rated as guests rather than cattle, for the ants groom their bodies and actually put the food into their mouths.

One such ant guest is a strange, dark-colored beetle that has lived underground so long that it has virtually nothing left of its wings. It receives careful treatment from the ants, and makes a return that appears to be adequate from the ants' viewpoint.

Upon demand the ants can draw, from certain hairy tufts growing on the beetle's body, a fluid that has the same attraction for ants that wine and brandy have for humans. And it has the same effects on these formicine tipplers, for after a hearty draught of it, they reel about and then fall over unconscious. But the effects are not permanent. After sleeping off their "jags," the ants are up and around again as briskly as ever, and apparently with no hangover.

Wine Cellar for Ants

Whatever the power of this liquid soporific, the ants apparently do not need it to go to sleep. Frequently they become drowsy in the heat of the day and can be found sleeping in various positions—crouching, lying on their sides, or resting on their hind legs.

The soldier ants are the heavy sleepers, for they slumber right through the jostlings of those about to sleep. Such activity may wake the small workers, but not for long.

• Science News Letter, 79:270 April 29, 1961

Do You Know?

Insects are the greatest single cause of damage to live timber.

Americans ate an average of 161.3 pounds of red *meat* last year, an all-time record.

The East gets 75% of all the *rain* that falls in the U.S.

Retinoblastoma is probably the only form of *cancer* directly inherited by humans.

The smallest *virus* known to science has been purified, weighed, chemically analyzed, photographed and taken apart.

An all-weather radar *altimeter* that can provide a range of zero to 5,000 feet has been developed.

Coestie, the dense and highly stable form of silica, was not known to exist naturally on earth before its collection and identification in 1960.

• Science News Letter, 79:270 April 29, 1961

INVENTION

Patents of the Week

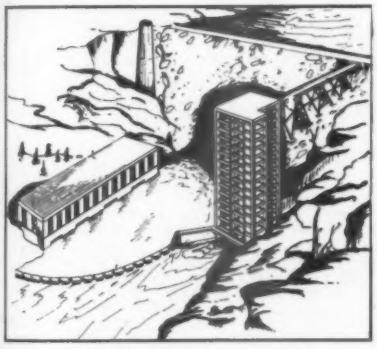
A chemical spray for higher fruit production of apple-trees, a water "staircase" for easier salmon migration over dams and a beacon for airplane rescues have been patented.

▶ A CHEMICAL SPRAY patented in Washington causes apple trees to yield a large amount of fruit each year instead of every other year.

Normally, such apple trees as Baldwin, Cortland or Golden Delicious have an "on" and "off" year, producing more fruit one year and more leaves the next.

Robert H. Beatty of Philadelphia, in U.S. patent No. 2,978,838 assigned to Amchem Products, Inc. of Ambler, Pa., claims that solutions of various derivatives of trichlorobenzoic acid, sprayed on the apple trees when the fruit buds bloom during the "on" year, produces annual instead of biennial bearing.

The inventor said that if the chemicals were applied to fruit trees during a certain period in a tree's growth, "the growth is so altered that fruit buds are formed where one would normally expect to find vegetative buds." Previous methods of thinning fruit trees by hand or by chemical means have, in general, proved unsatisfactory, the patent claims.



SALMON STAIRCASE

A spiral water "staircase" for salmon hurdling over dams during their migration upstream to spawn received another patent. The invention of James M. Wardle of Ottawa, Ontario, Canada, won patent No. 2,978,873. Rights were assigned to Northwest Power Industries Limited, Ottawa. A series of steps, or pools, provide a passageway for both the spawning salmon and their returning fingerlings, with every 12th pool designed as a stop-over, or resting place.

A ventilating and cooling system for automobile seats provides relief during warm months. Invented by Wesley F. Hake of Terre Haute, Ind., the system was awarded patent No. 2,978,972. An air scoop gathers up the air, and ducts circulate the air throughout the seats.

A better way to hold dental plates in place in a person's mouth is promised by Murray W. Rosenthal of New Brunswick, N. J., and Herbert A. Cohen of Brooklyn, N. Y., in patent No. 2,978,812, assigned to Block Drug Company, Inc, of Delaware. The fixative, which contains an ethylene oxide polymer, comes as a powder, film or paste that may be easily applied to the dental plates.

A portable beacon that guides rescue parties to an airplane crash by the distress signals it gives off won patent No. 2,979,608 for Janis Alfreds Sirons of Springfield, Ohio, who assigned the patent to the U. S. Army. The beacon transmits both high frequency signals for ground, automatic direction-finding networks, and ultra high frequency signals for air-borne equipment that pinpoints the crash area. The device is automatically ejected from an airplane hitting an obstacle and parachutes to the ground. The set begins broadcasting automatically on impact with the ground.

A chemical spray that prevents early blight disease on tomato plants has been patented by Arthur Lawrence Fox of Greenwood, Va., and Irving Joseph Krems of Vienna, Austria. Rights to patent No. 2,979,436 were assigned to Colgate-Palmolive Company of New York. The spray contains a metal salt (alkyl benzene sulfonate) that maintains a high resistance to the blight disease even after a heavy rainfall, the patent claims.

An improved "multi-stage flash evaporator" for de-salting the oceans is the subject of patent No. 2,979,443, granted to Adolf Frankel of Gosforth, Newcastle-on-Tyne, England, who assigned the patent rights to Richardsons, Westgarth & Co. Limited, of Northumberland, England. Most of the pure water that is distilled is siphoned off, but some of the water that is not so pure is recirculated to a boiler for re-use, according to the inventor.

An intravenous method of administering drugs for relaxing muscles during surgical operations was patented by Edwin J. de Beer of Tuckahoe, Charles H. Ellis of Scarsdale, and Walter Ide of Eastchester, N. Y. Awarded patent No. 2,979,055, assigned to Burroughs Wellcome & Co. (U.S.A.) Inc. of Tuckahoe, N. Y, a small electric current is periodically sent through a muscle pierced by an intravenous needle. Each time the muscle contracts, it absorbs some of the drug.

A long handled, portable "scoop" for gathering leaves and trash without doing much stooping over was awarded patent No. 2,978,731 for Fred V. Belluomini of Jackson, Calif. The scoop opening is automatically clanged shut by a grate when not in use to prevent leaves or trash from blowing away.

BRUSH-OFF GOGGLES
Use that ounce of prevention. Spare your eyes.
Walking in woods or country side? Keep brush, twigs, leaves, brambles out of your eyes. Prevent wood-chopping wood-chip eye injuries. Brush-off Goggles sturdily made of fine wire screening and black cotton strapping. Fits over glasses. Same as used by Dept. of Forestry.
Each $1.00 p.p. 6 for $5.00 p.p.
HARRY ROSS *Scientific & Lab Apparatus*
61-L Reade St., N.Y. 7, N.Y.

PRISMS $1.50

Made for U. S. govt. for tank periscopes. Fine optically ground, big precision prisms with silvered base. Terrific for all types of spectrographic work, in homemade telescopes & other optical systems for bending rays. Makes unusual paper weight (paint your name on it) or conversation piece for mantel. You'll find many other uses. NEW, PERFECT! Cost U. S. govt. $25 ea. **NOW—$1.50 ea. ppd. or 4 for $5.00.** Same as above—1" long (no silver backing) **$1. ea. 5 for $4.** Postage paid on prepaid orders. Calif. res. add sales tax.
Volume Sales Co., War Assets Div., Dept. C171
3828 Sunset Blvd. Los Angeles 26, Calif.

GIANT 10 FT. $1.00

Largest Distributors of U.S. Govt. Surplus Balloons in the USA. Inflate up to Giant 30 ft. diameter with air or gas. Fun at the Beach, Water Sports, etc., Flying Advt. visible for miles. Terrific for attracting crowds at Openings, Fairs, Roadside Stands, Gas Stations, Sports Events. Made of Durable Neoprene Rubber. New, never used. No C. O. D.'s.

2 ft. (Beach Ball Size) . .	2 for 50c (8 for $1.00)
6 ft. size	50c ea. (2 for $1.00)
10 ft. size	$1.00 ea. (6 for $5.00)
30 ft. size . $2.00 ea. plus 50c postage & handling	
30 ft. size illus. . .	10 for $30.00—Exp. collect

NOVEL MFG. CORP. 31 SECOND AVE., Dept. G-3631 NEW YORK 3, NEW YORK

MICRO-ADS
Equipment, supplies and services of special interest to scientists, science teachers and students, science-minded laymen and hobbyists.
25¢ per word, payable in advance. Closing date 3 weeks prior to publication (Saturday).
SNL, 1719 N St., N.W., Washington 6, D. C.

CHEMICAL AND PHYSICAL PROPERTIES OF The Elements. 28 pp. booklet alphabetically tabulates properties of 102 elements. Single copies $1.00. Quantity discounts. Columbia Associates, Box 591, Hudson, New York.

GOVERNMENT SURPLUS RADIOS, RECEIVERS, transmitters, gadgets, parabolic reflectors, infra-red snooperscopes, aircraft camera lenses. Amazing catalog 10¢. John Meshna, Malden 48, Mass.

INDOOR OBSERVATION BEEHIVES—FASCINating, entertaining, educational. Free bee literature. Bee Hobbyist, Box M-183, Edmond, Oklahoma.

NATIONAL GEOGRAPHIC MAGAZINES, 1888-1960 ,any issue. Periodical Service, Box 465-SN., Wilmington, Delaware.

PERIODIC CHART—POCKET SIZE! PLASTIC laminated. All elements, atomic weights, densities, valences, etc. Send $1.00. R. and S. Laminating Co., Box 111, Dept. 3, White Plains, New York.

ROCKET BUILDING INFORMATION SHEET. 15 drawings of proven methods, 50 cents. Rockets, P. O. Box 90391, Los Angeles 45, Calif.

WANTED: MICROSCOPIC PARTICLES OPAQUE or Chromophilic 5 to 40 microns in size 5 micron increments. Needed by research project. Funds available. Write Murco Research, Inc., P.O. Box 6006, Jacksonville 5, Florida.

THE AMERICAN BASIC SCIENCE CLUB

A Science Course Designed with the FUTURE in Mind...

Low Cost SCIENCE LAB

SOUND ELECTRICITY HEAT ELECTRONICS LIGHT ATOMIC ENERGY

COMPLETE LABORATORY COMES IN 8 KITS . . . ONE A MONTH
SUPPLIES ALL THE EQUIPMENT FOR ALL THE FOLLOWING:

ELECTRICAL EXPERIMENTS
Educational fun with Electro-Magnets, Transformer, Galvanometer. Rheostat, Relay, Voltmeter, Wheatstone Bridge, and other electric equipment.

RADIO RECEIVER
Three Tube Short Wave (80 Meter) and Standard Broadcast Receiver. Sensitive Regenerative Circuit uses regular 115 volt AC. Complete with Head Set.

DC POWER SUPPLY
Power Transformer, Vacuum Tube Rectifier and 20-20 mfd. Capacitor Filter Circuit. Converts home AC to the DC required for Electronic Circuits.

PHOTOELECTRIC EYE
Photoelectric Cell, Exciter lamp — and Electronic Relay. Everything you need to control motors, bells, alarms, and do other light beam experiments.

MICROPHONE
A sensitive carbon-button microphone that greatly amplifies unsuspected noise. Also adaptable for use with your radio transmitter.

ELECTRONIC EXPERIMENTS
Explore functions of vacuum tubes and other electronic components. Build an Electronic Switch—Amplifier, and other experimental circuits.

CODE PRACTICE SET
Signal Oscillator, Key and Flasher . . . the complete outfit to learn to receive and transmit the Morse Code . . . the first step to a Ham License.

STROBE LIGHT
A variable pulse neon lamp. "Freezes" motion of rapidly vibrating or rotating objects for close study and checking frequencies, RPM.

BROADCAST TRANSMITTER
Sends clear transmissions of both code and voice to nearby radios. Can be used with your microphone, record player, or code oscillator.

RADIO SERVICE EQUIPMENT
All the parts to build your own Radio Signal Tracer and a Probe Light Continuity Tester. Both pieces are invaluable in radio servicing.

SOUND EXPERIMENTS
Laboratory demonstration of sound waves, resonance and pitch. Includes Variable Frequency Oscillator, Sonometer and Ripple Tank.

TELESCOPE
A mounted astronomical Telescope. High quality ground Lenses enable you to examine details of the moon's surface and distant objects.

PHOTOGRAPHY LAB
Complete dark room equipment: Printer — Enlarger — Electronic Timer — Safe Light — Developing Trays and supply of paper and chemicals.

SLIDE PROJECTOR
Takes 16mm and 35mm slides, sharp focusing, convection cooled. G.E. Projection Lamp included. Also adaptable as a Projection Microscope.

MICROSCOPE
High and low power, precision ground Lenses, Substage Light and Polarizer. Adaptable for photomicrography in connection with Photo Lab.

SPECTROSCOPE
Fascinating optical instrument used to identify and analyze substances by observing the spectrum of their flame. Spectrum charts are included.

ATOMIC RADIATION EXPM.
A variety of projects using Spintharioscope and sensitive Electroscope. Radioactive sources included are Uranium Ore and Radium.

ATOMIC CLOUD CHAMBER
See illuminated tracks of speeding nuclear particles emanating from radioactive Alpha source and mysterious cosmic rays from outer space.

ULTRAVIOLET LAMP
Produces dazzling color effects with invisible "black light". Used extensively for crime detection, mineralogy and science. Fluorescent Ink, Crayon and Tracer Powder are included.

HEAT EXPERIMENTS
Study the Molecular Theory of heat using 2 Thermometers, Thermostat, 3 foot Gas Thermometer and special Microscope arrangement that shows the effect of Molecular Movement.

WEATHER STATION
Aneroid Barometer, Cup Anemometer that electronically measures wind speed. Sling Psychrometer, Humidity Gauge, Cloud Speed Indicator, Cloud Chart and Weather Map.

ALL THE EQUIPMENT FOR ALL THE ABOVE, only $29.60

These kits were developed with famous SOUTHWEST RESEARCH INSTITUTE

SwRI ADMINISTRATION BUILDING

and are a REAL SCIENCE COURSE

The 8 manuals are expertly written, clearly illustrated, excitingly different.

NO EXPERIENCE NECESSARY

You can complete every project and GAIN A VALUABLE SCIENCE BACKGROUND that will ENRICH YOUR LIFE and could SHAPE YOUR FUTURE!

EASY • FUN • EDUCATIONAL

Analyzing Glowing Gases with the SPECTROSCOPE

Trouble Shooting with the SIGNAL TRACER

PHOTOMICROGRAPH of a Fly's Wing made with Microscope and Photo Lab (Actual Size 5" diameter)

SEND ONLY $2.00 WITH COUPON

PAY ONLY $3.45 FOR EACH KIT YOU RECEIVE (ONE A MONTH FOR 8 MONTHS)

FREE SOLDERING IRON with Second Kit

Your Satisfaction or Your Money Back . . . AND you may cancel at any time without obligation.

These "no risk" assurances because we know you will be SURPRISED! AMAZED! DELIGHTED!

A VALUABLE SCIENCE LAB
Containing Parts by RCA, MALLORY, G.E., PYRAMID, STACKPOLE, TRIM and other reliable manufacturers.

Retail value of parts alone is over FIFTY DOLLARS.

FOR SAFETY!
Circuits are low voltage supplied by isolation transformer that comes with first kit

MEMBERS ARE ENTHUSIASTIC!

Congratulations on the organization of these kits. They are the best investment I've made in a long time.
James A. Carlson
137 Marose Drive
Pittsburgh, Pa.

Designing and offering this complete laboratory to the public at such a low price is a notable service to our society.
R. M. Holmes, Professor of Physics
East Carolina College, Greenville, N. C.

FREE! These 6 Auxiliary Textbooks

AMERICAN BASIC SCIENCE CLUB, Inc., San Antonio, Texas

AMERICAN BASIC SCIENCE CLUB
501 E. Crockett, San Antonio 6, Texas DEPT. SN

Start sending me A.B.S.C.'s "Science Lab" in eight kits, one each month. If not satisfied on inspection of first kit I may return it for immediate refund. (I choose the plan checked.)

( ) I enclose $2.00 and will pay $3.45 plus COD postage on arrival of each kit. I may cancel unshipped kits at any time.

( ) I enclose $29.60, full payment, *Postage Paid*, for all 8 kits. I may cancel any time and get full refund on unshipped kits.

NAME _____

STREET _____

CITY _____ STATE _____

MAIL COUPON TODAY